

**MOJAVE WATER AGENCY**

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**PRIORITY****PRIORITY****FAX TRANSMITTAL**

**DATE:** December 8, 2006 **PAGES INCLUDING COVER:** 91

**TO:** Department of Water Resources  
1) Tracie Billington  
2) John Woodling

**FROM:** Kirby Brill, General Manager

**FAX NUMBER:** (916) 651-9292

**COMMENTS:** **PROP 50, CHAPTER 8 FIRST FUNDING CYCLE RECOMMENDED PROJECT LIST**

Attached is a letter sent today—December 8, 2006—to DWR Director Lester Snow by Mojave Water Agency General Manager Kirby Brill in response to the draft recommendations for funding under Step 2 for the Integrated Regional Water Management Plan Implementation grants. The attached document contains three parts:

- 1) Part 1: Cover letter to Lester Snow
- 2) Part 2: Response to reviewer's comments
- 3) Exhibits as referred to under part 2

Mr. Brill looks forward to receiving your response.

**PLEASE DELIVER A COPY IMMEDIATELY TO BOTH MS. BILLINGTON AND MR. WOODLING - ATTEMPTS TO SEND VIA ELECTRONIC MAIL WERE UNSUCCESSFUL.**



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December 8, 2006

Mr. Lester Snow  
Director  
California Department of Water Resources  
1416 Ninth Street, Room 1115-1  
P.O. Box 942836  
Sacramento, CA 94236-0001

RE: Proposition 50, Chapter 8 First Funding Cycle Recommended Project List

Dear Mr. Snow:

This letter is being sent by the Mojave Water Agency (MWA) in response to the draft recommendations for funding under Step 2 for the Integrated Regional Water Management Plan Implementation grants. This letter contains two main parts. The first part contains justification for a recommendation that additional funds be allocated in round one of the Proposition 50 Implementation Grant process. The second part of the letter (contained as an attachment) provides specific responses to comments on the review summary of the MWA proposal. These responses are supported by detailed documentation of critical information (referred to as "Exhibits") that was provided to the State, which was apparently overlooked in the review process, resulting in a lower than justified score for the MWA grant proposal. MWA believes that when this additional information is taken into account, and the factors below are considered, it is justifiable and appropriate to include funding for the MWA proposal in the Round 1 funding.

### Part 1

Specific reasons for this recommendation for increased first round funding are:

#### **1. Legislative Requirement for geographic distribution of funds.**

At the November 16 public meeting, DWR indicated that approximately \$91 million would have to be allocated to qualified proposals from Southern California regions to meet the legislative mandate for geographic distribution of funds. This would imply that almost four additional plans could be funded in the Southern California region, beyond



the current recommendation, assuming an award of approximately \$25 million each. If both the remaining Southern California proposals were funded in Round 1 (MWA and SAWPA), that would still leave \$41 million available for other qualified proposals. This would allow for all of the Southern California "cream of the crop" (a term used by DWR representatives) proposals short-listed from Step 1 to be funded consistent with legislative mandates. The MWA proposal and its IRWMP is easily justified as part of this elite "cream of the crop" group given the additional information provided in the second part of this letter, and the fact that the MWA IRWMP received the highest numerical ranking of ALL the proposals in the State during the Step 1 screening process.

**2. Legislative Requirement for adoption of Integrated Regional Water Management Plans.**

According to Water Code Section 79562.5 (c), the Department may only waive the requirement for consistency with an adopted IRWMP until January 1, 2007. This will likely further limit the number of additional qualified regions beyond those already included in the Step 2 process, especially in Southern California. Therefore, funding of two additional qualified Southern California regions (MWA and SAWPA) would accelerate the program and still leave funding available for the distribution of funds in the event that a limited numbers of other regions are able to meet the minimum required standards. **What the State should NOT consider, however, is moving the funds allocated for Round 2 into the Proposition 84 process.** This would have the potential of ignoring the minimum standards set by the Legislature for Proposition 50. It would also penalize those such as MWA, which choose to proactively buy into the Integrated Regional Planning philosophy and adopt Plans early on.

**3. Take advantage of current high quality proposals, which have already been thoroughly reviewed by State staff.**

A tremendous amount of effort went into organizing IRWM plans within regions and preparing extensive proposals. The grant application process for the first funding cycle of State Proposition 50, Chapter 8 Integrated Regional Water Management Program was considered by many as one of the most extensive and expensive grant programs administered in the history of DWR and the SWRCB. The various regional grant applicants spent hundreds of thousands of dollars in public funds preparing their grant applications to meet the new State requirements and present well developed, ready-to-proceed projects. There is a tremendous opportunity for the State to advance high-quality integrated water resources management proposals without waiting an extended period of time and without expending more resources.

**4. Passage of Proposition 84 provides more IRWMP funding, and Proposition 50 funds should be allocated immediately.**

With the passage of Proposition 84 in November 2006, voters indicated their intent to see \$1 billion allocated for IRWM plans and projects in the State. Since these funds have been allocated to regions covering the entire State, significant funds will be made

available to the IRWMP program. Given that four years have elapsed since the passage of Proposition 50, expedited allocation of Proposition 50 monies to well-crafted, ready-to-implement Southern California programs is the most effective, efficient and reasonable way of disbursing remaining Southern California monies.

**5. Funding of Proposition 50 applications must not be delayed through consolidation with the Proposition 84 process.**

With the passage of Proposition 84, many months will go by to revise grant guidelines and solicitation documents before a second implementation grant cycle can be initiated. More grant applications and projects can and should be funded now to be responsive to voters by getting as much grant funding as possible out to regions that have projects ready to be implemented. **Again, we highly recommend AGAINST any consideration of consolidating available Round 2 funding from Proposition 50 into the Proposition 84 process.** This would further delay the distribution of available funding while new guidelines are established for Proposition 84.

**6. Precedent for Second Funding Cycle Transfer Exists.**

Based on criteria established by the State, the original first funding cycle of Proposition 50, Chapter 8 Implementation program was to be \$150 million. After evaluation of Step 2 applications, the amount of funding for the first funding cycle changed from \$150 million to \$175 million after three projects tied in ranking, and an additional \$25 million is proposed to be transferred from the second funding cycle to the first funding cycle. By this transfer, it is clear that DWR has some flexibility in how much can be allocated in each funding cycle and can do so if there is a clear benefit to the State. Additionally, the original maximum award was capped at \$50 million during Step 1, but was modified to \$25 million during Step 2. Further, during the planning grant process in 2005, more proposals were funded beyond the preliminary list based on public review.

**7. Expediting for Funding Benefits State.**

Proposition 50 was passed by the voters in November of 2002. Funds under Proposition 50, Chapter 8 for the IRWMP Implementation are now being proposed to be released in 2007. To avoid further delays in utilizing these funds, several excellent IRWMP projects have been thoroughly screened by State staff and are ready to go, with minor modifications. By increasing the funds available now, additional water resource projects can be expeditiously implemented, thus meeting the legislative goals of generating new water supplies and improved water reliability for the State. The projects proposed will lead to readily identifiable jobs and revenue that will be important to regional and State economics. It is in the State's interest to take advantage of these water supply, water quality and economic benefits now.

Please note that there are two attachments to this letter:

- Mojave Water Agency Comment Letter Part 2 – Response to Reviewer Comments
- Exhibits A-Q in support of Response to Reviewer Comments (Part 2)

We appreciate your consideration of this request and look forward to hearing from you and your staff regarding this proposal.

Sincerely,

  
Kirby Brill  
General Manager

enclosures:

- 1) Mojave Water Agency Comment Letter Part 2 – Response to Reviewer Comments
- 2) Exhibits A-Q in support of Response to Reviewer Comments (Part 2)

c: Tracie Billington, DWR  
John Woodling, DWR

dwr prop 50 ltr 120806.doc/publio/prop 50/step 2

**Mojave Water Agency Comment Letter Part 2 – Response to Reviewer Comments**  
**December 8, 2006**

**Proposition 50 Step 2 – Responses to Proposal Evaluation**

PIN: 9610  
Applicant Name: Mojave Water Agency  
Project Title: Mojave Water Agency Integrated Regional Water Management Plan

Funds Requested: \$25,000,000  
Total Project Cost: \$48,594,500

The Mojave Water Agency has reviewed the comments provided by the Proposition 50, Chapter 8, IRWMP Grant Program – Implementation Step 2, 1<sup>st</sup> Funding Cycle solicitation proposal. Based on the Proposal Evaluation review of our application, the Mojave Water Agency is providing the following comments and documentation of information submitted previously to the State as part of the referenced application. The Mojave Water Agency in general feels that our adopted IRWMP and Program EIR (September 2004) contained many integral components to our application that were not repeated in the application Step 2, but were, however, provided in Step 1. We have provided the following outline of comments in an attempt to show that our IRWMP is complete and meets all the requirements of the IRWMP standards and concepts for the State of California.

**Attachment 5: WORK PLAN 6 of 15 points.**

- 1) **Reviewer Comment:** *"The goals in the work plan need to be more 1) more detailed, more specifically tied to each project..."*

**Applicant Comment Response:** The reviewer's comments are somewhat confusing. The sentence before states that "...references to the IRWMP clarify the priorities of the projects and their relationship to management strategies". This would imply that the reviewer understood the tie to the goals and objectives of the IRWMP (i.e. those that were the basis for the management strategies), but missed the tie to the goals and objectives of the "work plan". From MWA's perspective, the "work plan" is the IRWMP. This grant application was seen to be but an implementing extension of the IRWMP. MWA's understanding is that the purpose of this grant is to implement actions that were the result of exhaustive evaluation that should have occurred as part of the IRWMP development process. As such, in its Step 2 application MWA relied heavily on the work and evaluation carried out in the IRWMP development process. We think it would be inconsistent to have another set of goals and objectives in the grant "work plan" that differs from those so laboriously derived from the IRWMP process.

- 2) **Reviewer Comment:** *"The goals and objectives in the work plan need to be more... measurable."*

**Applicant Comment Response:** We again refer to the thorough analysis conducted as part of the IRWMP that evaluated combinations of projects and management

actions against a specific set of performance objectives established by the Technical Advisory Committee. These performance objectives were included in the Step 2 grant proposal package as part of the adopted IRWMP (Exhibit A). In addition to establishing performance objectives, there was also a rigorous systemic analysis conducted using the STELLA modeling platform to evaluate how certain combinations of alternatives best met those established performance objectives. This process was documented in a Technical Memorandum that was included in the Appendices of the IRWMP and as part of the Step 2 grant application (Exhibit A). All of the projects submitted as part of the Step 2 proposal were included in this evaluation. MWA assumed that the State would be looking more at how each project fulfills much larger, regional (State Water Plan emphasis on Integrated Regional Water Management Planning) performance measures, rather than project by project performance measures.

- 3) **Reviewer Comment:** *"Work Items are general with several key details absent, such as design parameters and standards."*

**Applicant Comment Response:** The design parameters were listed for each construction project and included all aspects for the project. These parameters have been used to formulate the basis of the Request for Proposal issued by MWA in December 2006 for design services. The design standards were listed in the work plan. See Exhibit B, Excerpt from Attachment 6 -Work Plan submitted with our grant application.

- 4) **Reviewer Comment:** *Work Items are general with several key details absent, such as land acquisition requirements.*

**Applicant Comment Response:** For each construction project the specific land acreages were listed that would be required for each project, and the text explained that property title documents and appraisals would be done by consultants. MWA is a public agency, and land acquisition is governed by State Laws included in the California Law codes; we did not include these Law codes with our work plan. See Exhibit C, Excerpts from Attachment 6 -Work Plan submitted with our grant application.

- 5) **Reviewer Comment:** *Work Items are general with several key details absent, such as specific permits required and status.*

**Applicant Comment Response:** For each construction project the specific permits were listed that would be required for each project, and the text explained that submittal for permits would commence once final construction drawings were available to be reviewed and approved by the individual permit entities. See Exhibit D, Excerpts from Attachment 6 -Work Plan submitted with our grant application.

- 6) **Reviewer Comment:** *Work Items are general with several key details absent, such as PAEP or monitoring plan.*

**Applicant Comment Response:** For each construction project the specific reporting and monitoring requirements were listed. The reports during design and construction would provide quarterly reports on all aspects for each project (these include

monitoring reports). Following the completion of each project the monitoring would focus on the PAEP, and monitoring schedules would be negotiated with the DWR at that time. MWA has successfully executed several grants and loans with the DWR in previous years. MWA has a long track record of reporting and documenting work funded by the State. See Exhibit E, Excerpts from Attachment 6 -Work Plan submitted with our grant application.

- 7) **Reviewer Comment:** *The work item submittals are limited to regular progress report during construction.*

**Applicant Comment Response:** For each construction project there are a variety of reports and monitoring is required. The EIR (Groundwater Replenishment Program, January 2006) included with the grant application has many mitigation measures that require monitoring and reporting. The text in our application clearly states that submittals are **not limited to construction**. See Exhibit F, Excerpts from Attachment 6 -Work Plan submitted with our grant application.

- 8) **Reviewer Comment:** *CESA Incidental Take and Streambed Alteration Agreement and other permits may be required...*

**Applicant Comment Response:** The IRWMP PEIR clearly states the responsibilities of MWA in implementation of the projects and the requirements of meeting CESA. Attachment 15 – Modification of River or Stream Channel of our application discusses any permit potential for this item. The review comment seems to imply that MWA does not know what permits will be required to do the projects. In March 2006 MWA, as the responsible agency, completed a \$60 million pipeline and recharge basin project in the same general area of the project proposed in our application. MWA obtained all the permits for this project. See Exhibit G, excerpts from Attachment 15 about Streambed Alteration Agreements and PEIR regarding California Endangered Species Act.

#### Attachment 6: BUDGET 2 of 5 points

- 9) **Reviewer Comment:** *Detailed budgets do not contain supporting documentation.*

**Applicant Comment Response:** Over the past ten (10) years, the Mojave Water Agency has constructed two major pipeline and recharge facilities in our area. Both projects have been reported to the California Department of Water Resources in accordance with the funding source reporting agreement. MWA has many reports and documents that substantiate the unit cost factors included in our project budget. For indirect project costs, such as engineering and technical services, the MWA has several engineering consultants under contract. The work is being done by unit rates and formed the basis for our unit costs in the budget. The Mojave Water Agency could have provided copies of these documents if this was a requirement to improve our score.

- 10 **Reviewer Comment:** *Detailed budgets for recharge project contain numerous inconsistencies; for example, the number of wells to be constructed in the work plan differs from the budget.*

**Applicant Comment Response:** For the number of wells, this project will be phased. Initially, five (5) wells will be installed, and in the future **up to 22 wells** could be installed, as is stated in the project description part of the application. Exhibit H shows documentation from the engineering firm Bookman Edmonston demonstrating the sound cost detail for the first phase of the project five (5) wells as well as subsequent phases of the project (eight [8] and nine [9] wells, respectively for twenty-two [22] production wells total).

- 11) **Reviewer Comment:** *Permit and environmental costs should be included for the weed removal project.*

**Applicant Comment Response:** According to the Mojave Desert Resource Conservation District, working in conjunction with the California Department of Fish and Game and U.S. Fish and Wildlife Service. **There are no permit costs** due to the fact that the plan does not call for any form of streambed alteration and thus, not requiring a permit from governing agencies. All agencies have agreed that once funding is obtained, they would then move forward with the **immediate eradication** of non-native species. See Exhibit I, Excerpts from the Mojave Weed Management Area - MOU between Federal, State, County and local agencies regarding plant removal. This document was submitted with Attachment 8.

**Attachment 8: SCIENTIFIC and TECHNICAL MERIT**

**6 of 15 points**

- 12) **Reviewer Comment:** *Documentation regarding operation of the proposed recharge facility... are absent.*

**Applicant Comment Response:** Detailed operation costs for the recharge projects were included in the supporting documentation heavily referred to and included with the grant application. See, Exhibit J, excerpts from the Technical Study to Evaluate a Potential Long-Term Water Management Program Between The Mojave Water Agency and Metropolitan Water District. This document was submitted with Attachment 8.

- 13) **Reviewer Comment:** *"However, documentation regarding...the project's ability to alleviate basin's overdraft... are absent"*

**Applicant Comment Response:** The "project" as referred to in the reviewer's comments is part of a portfolio of actions and management actions evaluated in the IRWMP to address the Basin Management Objectives (see Exhibit K) which include "Balance future water demands with available supplies". It was never intended for any one project to be the "silver bullet" to cure overdraft. However, the two projects (which are a subset of the original projects proposed in Step 1) listed in the Step 2 application will significantly advance balancing future supply with demand. For example, the two water supply projects presented in the Step 2 application (Upper Mojave River Well Field and Water Supply Pipeline Project and Oro Grande Wash Project) have stated recharge capacities of 40,000 acre-feet per year and 8,000 acre-feet per year, respectively. Just these two projects alone would provide the ability to exceed the requirements for meeting year 2025 estimated overdraft for the Alto sub-basin (40,800 acre-feet) as stated in the 2005 UWMP (Exhibit K). Furthermore, additional high-priority projects identified in the IRWMP process, but not

recommended for funding under the Step 2 application, would provide additional recharge capacity. In addition, MWA's revised 2005 UWMP (note that during a pre-application meeting on May 5, 2006, DWR instructed MWA not to submit the 2005 UWMP as part of the application because DWR was already in receipt of the document) clearly shows how supplies will be available through the year 2025 to meet the projected demands and fulfill the stated Basin Management Objectives. Thus, with additional references to the documentation provided in the Step 2 application, MWA has demonstrated how the proposed projects will be vital components of the integrated portfolio of projects and management actions that will "alleviate the basin's overdraft".

- 14) **Reviewer Comment:** *"However, documentation regarding...the management of TDS in the Mojave River floodplain are absent."*

**Applicant Comment Response:** This was fully analyzed in the PEIR of the IRWMP and the 2006 Groundwater Replenishment Program EIR. Both documents were submitted to the State as part of the application. Exhibit L provides excerpts from the PEIR submitted as part of MWA's application. For additional detail, refer to the Project EIR (January 2006) also submitted as part of the application.

- 15) **Reviewer Comment:** *Documentation Details of operation, execution, and projected water conservation for the weed eradication project are not provided.*

**Applicant Comment Response:** The operation/monitoring and execution of the weed management efforts were well documented in the Mojave Weed Management Authority's **Saltcedar Control Plan – 2004** and **Long Range Plan – 2003**. The estimated water savings were determined and documented by the United States Geological Survey in the 1995 report titled **Riparian Vegetation and Its Water Use During 1995 Along the Mojave River**. All of the above referenced documents were provided to the reviewers with the grant application. See Exhibit M for key excerpts. These documents were submitted with Attachment 8.

- 16) **Reviewer Comment:** *A discussion of data gaps is missing.*

**Applicant Comment Response:** Data gaps regarding recharge projects are addressed in the MWA's IRWMP. The Mojave Weed Management Area addresses continuous and long-term monitoring efforts explicitly in their **Salt Cedar Control Plan** and **Long Range Plan**. The PAEP for Regional Water Conservation addressed data gaps and a plan to fill them. Excerpts of the above referenced documents are included as Exhibit N. These documents were submitted with the application as Attachments 8 and 9.

**Attachment 11: OTHER EXPECTED BENEFITS 4 of 10 points**

- 17) **Reviewer Comment:** *There is not sufficient information to support with certainty that the proposal will provide all the benefits claimed.*

**Applicant Comment Response:**

MWA listed five other expected benefits resulting from the implementation of the projects in the proposal. Each other expected benefit can be clearly identified as to



cause and effect. We are not clear on the comment. Does this comment mean the reviewer doubted the claimed benefit based on the implementation of the project in the proposal? Or does this comment mean MWA did not rewrite the parts of the IRWMP that detail the benefits of projects in the proposal? The derivations and interpretation for the other expected benefits seems clear given the concepts shown below.

- **Ecosystem Restoration/Habitat Improvement:**
  - Cause: Remove non-native plants
  - Effect: Improve opportunity for return of native vegetation
- **In-stream Flows:**
  - Cause: Recharge overdrafted basin
  - Effect: Increase underflow to downstream areas
- **Water Storage Benefits:**
  - Cause: Recharge overdrafted basin
  - Effect: Increase water in storage
- **Fire Suppression:**
  - Cause: Remove non-native plants
  - Effect: Reduce fuel for fires
- **Regional Benefit of supplying water for overdrafted basin.**
  - Cause: Recharge overdrafted basin
  - Effect: Increase groundwater levels in regional area

**18) Reviewer Comment:** *Overall the Other Expected Benefits are low to average.*

**Applicant Comment Response:**

The scoring of this section is completely subjective. High and low are determined based on what criteria? Three of the other expected benefits claimed by our proposal are included in the Regional Board's Watershed plan for the Southern Lahontan region. The remaining two other expected benefits in our proposal are directly related to groundwater recharge and storage. This element for groundwater recharge and storage is the most important part of the adopted IRWMP. For the overall other expected benefits to be rated low to average is implying that our IRWMP is low to average, on which we adamantly disagree.

**Attachment 12: PROGRAM PREFERENCES 4 of 5 points**

**19) Reviewer Comment:** *"The certainty of improved water supply reliability is not fully demonstrated."*

**Applicant Comment Response:** This comment assumes that the reviewer did not see the section entitled "Section 2 – Step 4: Reliability of Supply" included in the Step 2 application (Exhibit O) as part of the "2005 Urban Water Management Plan Update", or that the reviewer did not judge the analysis adequately. MWA obviously feels that the analysis strongly supports how implementation of the proposed projects under the IRWMP will improve water supply reliability.

- 20) **Reviewer Comment:** *"The proposal could achieve its goal; but it is unclear whether there is enough additional water supplies to support both the estimated future population growth..."*

**Applicant Comment Response:** This comment is again fully addressed in the 2005 Urban Water Management Plan Update submitted to DWR. Most specifically, Table 5-15(s) (Exhibit P) demonstrates that average annual water supplies will be able to meet projected demands beyond the required 20-year planning horizon of 2025 without additional overdraft. It is unclear if the reviewer wanted more long-term certainty than what is required for in the water code for Urban Water Management Plans.

- 21) **Reviewer Comment:** *"The proposal could achieve its goal; but it is unclear whether there is enough water to ...and reverse the existing groundwater overdraft."*

**Applicant Comment Response:** First of all, there was never any stated intention to "reverse" the overdraft as part of the adopted Basin Management Objectives. The relevant adopted Basin Management Objective is to "Balance future water demands with available supplies recognizing the need to: stabilize the groundwater basin storage balance over long-term hydrologic cycles...". Therefore, the grant application and the projects therein should not be compared to an inappropriate standard. Furthermore, MWA finds it difficult to understand how the reviewer could be unclear about the availability of water given the extensive amount of analysis contained in the RWMP, PEIR of the Plan and the 2005 UWMP. For sake of brevity, we refer again to Table 5-15(s) (Exhibit P) contained in the 2005 UWMP. This demonstrates how demands will be balanced with supplies beyond the planning to ensure that the previously stated Basin Management Objective is met.

**Attachment 13: STATEWIDE BENEFITS 18 of 30 points**

- 22) **Reviewer Comment:** *"with some degree of certainty"*

**Applicant Comment Response:** In the PSP, the scoring standard for this attachment states that a score of 4 will be awarded if the Proposal demonstrates **some degree of certainty** that the Statewide priorities claimed can be achieved. The review comment seems to indicate that our application did meet the criteria.

- 23) **Reviewer Comment:** *The benefits to the Delta appear questionable and are not well supported.*

**Applicant Comment Response:** The Mojave Water Agency area and IRWMP are located within the CALFED Solution Area. We take exception to this comment. MWA's IRWMP provides for programs and facilities that can take advantage of wet years when water is abundant, and via groundwater storage and conjunctive use reduce our water needs during dry years. This program and water use method is also included in our RWMP. In Attachment 16 of the application, MWA states that the Delta will benefit if MWA does not take water from the Delta during dry years, thus reducing the imbalance between Bay-Delta water suppliers and users. See Exhibit Q, excerpts from the Attachment 16 – CalFed ROD Consistency.

## Exhibit A

Excerpts from the submitted IRWMP and Appendix B of the IRWMP documenting how the each of the projects included in the IRWMP (including those submitted as part of the step 2 grant application) were evaluated against very specific performance measures.

## Performance Measures

For each part of the Basin Management Objectives, performance measures were proposed and discussed at the August TAC workshop. Input from this discussion is included below. The resulting performance measures can be grouped into six broad categories, as follows:

- Storage levels – relating to groundwater accessibility, environmental groundwater elevations, and subsidence potential
- Supply-demand balance – relating to water supply sustainability, mismatch between supply and demand, water supply operations and contingency plans
- Economics – relating to project costs, benefits related to water supply, mitigation requirements, and funding sources
- Water quality – relating to the suitability of water for a particular use, and expected changes in water quality
- Equity – relating to the fair and equitable distribution of benefits and costs
- Implementability – relating to the institutional complexity, potential redirected impacts, and environmental impact of proposed projects

A discussion of the Performance Measures proposed for use for the MWA Regional Water Management Plan Update is presented in Appendix B.

## Projects and Management Actions

Phase 1 of the Regional Water Management Plan Update (RWMP Update) provided an array of projects and management actions that can both mitigate groundwater overdraft and meet the water supply needs of the MWA service area for the next two decades. Proposed projects and management actions were tailored to address at least one key water management issue in the basin, as well as help satisfy the Basin Management Objectives.

The purpose of this evaluation is to reasonably estimate specific parameters for **Supply Enhancement Projects** and **Management Actions** identified for the RWMP Update. These parameters were used to develop and evaluate **Alternatives** designed to address the key water management issues summarized above.

The following terms defined below are used throughout this document:

**Supply Enhancement Project (Project)** - A project providing water supply enhancement through groundwater recharge or an increase in groundwater recharge efficiency.

**Management Action** - An action improving water quality or environmental habitat. Additionally, an action increasing net water supply by implementing conservation, storage agreements, or water transfers.

TECHNICAL MEMO 3  
**ALTERNATIVES EVALUATION**  
MOJAVE WATER AGENCY REGIONAL WATER MANAGEMENT PLAN UPDATE  
PHASE 2

APRIL 24, 2003

## Introduction

The Phase 1 Report for the Regional Water Management Plan (RWMP) Update identified six key water management issues facing the Mojave Water Agency (MWA) service area. These issues are:

- Current demand exceeds supply; future demand will also exceed supply unless corrective actions are taken
- Naturally occurring water quality problems affect drinking water supplies
- Many of the groundwater basins are in overdraft
- All but two of the subareas have riparian ecosystem maintenance issues
- Wastewater infrastructure issues affect the two subareas with the largest water demands
- Many subareas within MWA are impacted by activities in other subareas

The RWMP Update Phase 1 Report also identified unique sets of each of these key issues contained within each subarea and provided an array of projects and management actions that could be used to mitigate one or more of these issues. In the Projects and Management Actions Technical Memorandum specific parameters for these projects and management actions were estimated.

The projects and management actions were grouped into alternatives that were then evaluated to determine how well they mitigated the key management issues identified above. This evaluation was performed using a simulation model developed in this phase using the Stella 7.0 software. Using the results of the evaluation, two recommended alternatives have been selected and the projects and management actions included in those alternatives that have the highest priority for implementation have been identified.

## The MWA Screening Model

The MWA Screening Model has been developed to simulate the changes to groundwater hydrology, Mojave River flows, and pumping and return flow patterns that would result from implementation of the projects and management actions identified in the Phase 1 Report. The model was developed using the Stella 7.0 software, a simulation modeling package that allows model parameters to be changed and new results obtained quickly and easily.

To model the water system, the Mojave River Basin floodplain and regional aquifers have been subdivided into 14 distinct but inter-connected aquifer units. The Lucerne Valley, Copper Mountain Valley, Means/Ames Valley, and Warren Valley aquifers are modeled independently.



## Exhibit B

Excerpts from the MWA's Grant Application Attachment 5 – Work Plan, listing the standards and design parameters (conditions) that were included in our application for this section.

Once a **Design/Engineering** Consultant is selected, the project detailed design will begin. MWA will provide oversight for the design of the project. The design consultant will use AWWA, ACI, AASHTO, AWS, ASTM and ANSI specifications for the materials and design criteria in developing the specifications for the project.

PARAMETERS

STANDARDS

The major considerations during the **design** phase of the project will include:

- Pipeline material: alternatives for pipeline material will be considered during design, such as ductile iron, welded steel or concrete cylinder pipe. The pipe cost is by far the largest expense on this project.
- Other pipeline design features: design flow, filling and testing, hydraulic losses, surge analysis, transient loads, design stresses, deflection, joint configuration, access manways, air and vacuum valves, blowoffs, isolation valves, tunneling requirements, hydraulic considerations, cathodic protection, carrier pipe, traffic plans,
- Trench construction and backfill material: avoiding paved roadways, existing utility crossings, heavily traveled roads, relocation of utilities, use of native material for trench zone and pipe zone backfill, percent of densification of backfill. The trench configuration and material used for backfill are large factors in the contractors bid price, and poor definition of these factors can increase project cost.
- Location of facilities: locating project facilities will be key to several work items, land purchase, easements, and permits, and must incorporate detailed information prior to acquisition and approval.
- Other facility design features: Pumping plants – pump selection, electrical requirements, pump control valves, noise, motor controls, telemetry, building layout, maintenance. Turnouts – Flow requirements, building layout, pressure reduction, telemetry, maintenance, meters. Reservoirs – size, painting and coating, corrosion control, foundation, HGL hoop stress, sliding design loads, site development.
- Well Field: Design consideration for well construction materials and methods, well depth, location, size, and aboveground appurtenances. The design of the well field will include an interconnecting piping system.

At the completion of the Project design bid documents (Construction Contract), drawings and specifications will be used for public bidding of the project. The consultant will assist the MWA in bidding and evaluating the construction bids. During construction the Design consultant will review and approve any changes or corrections to the plans and specifications. The Design consultant will also prepare a plan for telemetry and operation and maintenance manuals.

### **Construction Implementation / Construction Administration**

The construction phase of the project will start with the solicitation of bids for work. The bidding documents will include: advertisement for bids, instructions to bidders, certification for contract, non collusion affidavit, bid schedule, list of suppliers and subcontractors, construction schedule, bid bond, compliance statement, notice of award, performance bond, payment bond, change order, equal opportunity, special conditions, drawings and specifications. Bidders will be required to have the appropriate class of contractor license. A Construction Management (CM) firm will be selected prior to the bidding of the project. The CM firm will oversee the day to day operation of the contractor and coordinate the work of project.

The final contracting plan will include contract(s) for pipeline installation, recharge facility, extraction wells, monitoring wells, water tanks, pump stations, and control buildings. Several items of work may be

The work for this item will start several months after the design and will be completed prior to the public bidding for the construction work.

Land Purchase: estimated acres to purchase: 10 acres for recharge ponds

Easements: estimated acres for temporary construction easements: 20 acres - pipeline

During the initial design phase of the project, the permits required for the project will be identified. Based on the 10 % design progress to date, an initial list of permits (see below) has been developed. Some permits will require issued construction drawings be completed and reviewed by the permitting entity; these permits will be completed prior to the bidding of the construction contracts. MWA Staff, in conjunction with the Right-of-Way Consultant and Design Engineer, will obtain the permits required for the project. Several of the construction permits will be included in the construction contractor's scope of work. The construction contractor will be required to obtain the permits prior to the Notice to Proceed.

Permits: The following permits are anticipated to be required for this project:

- CalTrans for crossing Interstate US395
- San Bernardino County Flood Control and Roads Department
- Construction NPDES permit
- U.S. Fish and Wildlife Service
- Army Corp 404 permit
- California Department Fish and Game
- Various utility crossing permits
- Cities Victorville, and Adelanto excavation permits
- DWR turnout agreement/permit

#### **Planning / Design/Engineering / Environmental Documentation & Mitigation**

The planning for this project is completed and is part of the IRWMP.

This project has an approved and adopted **environmental document in full compliance** with CEQA and all other environmental laws.

In January 2006 an **Environmental Impact Report (ERI)** was approved and adopted by the Mojave Water Agency. MWA is the CEQA lead agency for this EIR. The report is included with this proposal as reference material listed in Attachment 8.

The implementation of the **Mitigation Measures** during construction will be done by consultants. Biological and Cultural consultants will be contracted to do the monitoring and reporting work prior to and during construction. These consultants will also perform investigations and/or site-specific surveys during the design phase of the project.

Currently, the **Design** of this project is 10 % complete. Design analysis is started and major facilities have been identified and located on a site plan. The background geological and seismic literature has been reviewed. The EIR and IRWMP include project objectives and constraints.

Once a **Design/Engineering** Consultant is selected, the project detailed design will begin. MWA will provide oversight for the design of the project. The design consultant will use AWWA, ACI, AASHTO, AWS, ASTM and ANSI specifications for the materials and design criteria in developing the specifications for the project.



**PARAMETERS**

**STANDARDS**

The major considerations during the **design** phase of the project will include:



- **Pipeline Material:** alternatives for pipeline material will be considered during design, such as ductile iron, welded steel or concrete cylinder pipe. The pipe cost is by far the largest expense on this project.
- **Other Pipeline Design Features:** flow design, filling and testing, hydraulic losses, surge analysis, transient loads, design stresses, deflection, joint configuration, access manways, air and vacuum valves, blowoffs, isolation valves, tunneling requirements, hydraulic considerations, cathodic protection, carrier pipe and traffic plans.
- **Trench Construction and Backfill Material:** avoiding paved roadways, existing utility crossings, heavily traveled roads, relocation of utilities, use of native material for trench zone and pipe zone backfill and percent of densification of backfill. The trench configuration and material used for backfill are large factors in the contractor's bid price, and poor definition of these factors can increase project cost.
- **Location of Facilities:** locating project facilities will be key to several work items, land purchase, easements, and permits. The design must contain detailed information prior to land acquisition and approval.
- **Other Facility Design Features:** Turnouts – Flow requirements, building layout, pressure reduction, telemetry, maintenance, meters. Recharge Basin – size, discharge structures telemetry, building foundation, site development, access roads.

At the completion of the Project, design bid documents (Construction Contract), drawings and specifications will be used for public bidding of the project. The consultant will assist the MWA in bidding and evaluating the construction bids. During construction, the Design consultant will review and approve any changes or corrections to the plans and specifications. The Design consultant will also prepare a plan for telemetry and operation and maintenance manuals.

### **Construction Implementation / Construction Administration**

The construction phase of the project will start with the solicitation of bids for work. The bidding documents will include: advertisement for bids, instructions to bidders, certification for contract, non-collusion affidavit, bid schedule, list of suppliers and subcontractors, construction schedule, bid bond, compliance statement, notice of award, performance bond, payment bond, change order, equal opportunity, special conditions, drawings and specifications. Bidders will be required to have the appropriate class of contractor license. A Construction Management (CM) firm will be selected prior to the bidding of the project. The CM firm will oversee the day-to-day operation of the contractor and coordinate the work of project.

The final contracting plan will include contract(s) for pipeline installation, aqueduct turnout facility, recharge facility and pressure reduction valve building, monitoring wells. Several items of work may be combined and bid in the same contract; and all construction contracts will be bid at the same time-June 2007. All construction work for the project is scheduled to be completed in May 2008.

During the construction implementation, the construction administration work will consist of reviewing the progress of the work in accordance with an approved project schedule. A pre-construction meeting will be held prior to the issuance of the Notice to Proceed. Weekly construction meetings will be held with MWA, the contractor's representative, construction management firm, and respective local entities, such as CalTrans and utility companies. The Design firm will be required to review the technical submittals required under the contract, such as concrete mix design, backfill procedures, contractor furnished material and equipment. The Construction management firm will maintain the project records and all



of MWA's Staff with assistance from time to time from the Project Engineering firm. Once the facilities and pipeline route have been selected and the quantity of land purchased and easements required is known, MWA will obtain the services of Right-Of-Way acquisition firm to perform the land procurement and easement work. This will include appraisals, title work, surveying, plat maps, legal document preparation, and condemnation should it be required.

The work for this item will start several months after the design and be completed prior to the public bidding for the construction work.

**Land Purchase:** Estimated acres to be purchased: 100 Acres for extraction well field  
8 acres for pump & tank facilities

**Easements:** Estimated acres for temporary construction easements: 80 acres - pipeline

LAND FOR  
UPPER MOJAVE  
River  
Project.

During the initial design phase of the project the **Permits** required for the project will be identified. Based on the 10 % design progress to date, an initial list of permits, (see below) has been developed. Some permits will require issued for construction drawings be completed and reviewed by the permitting entity, and these permits will be completed prior to the bidding of the construction contracts. MWA Staff in conjunction with the Right-Way Consultant and Design Engineer will obtain the permits required for the project. Several of the construction permits will be included in the construction contractor's scope of work. The construction contractor will be required to obtain the permits prior to the notice to proceed.

**Permits:** The following permits are anticipated to be required for this project:

- Caltrans for crossing Interstate Highway I-15 and US 395
- San Bernardino County flood Control and Roads Department
- Construction NPDES permit
- U.S. Fish and Wildlife Service
- Army Corps 404
- California Department Fish and Game
- BNSF Railroad crossing permit for pipe jacking
- Various utility crossing permits
- Cities of Hesperia, Victorville, and Adelanto excavation permits.

#### **Planning / Design/Engineering / Environmental Documentation & Mitigation**

The **planning** for this project is completed and is part of the IRWMP.

This project has a approved and adopted **environmental document in full compliance** with CEQA and all other environmental laws. In January 2006 an **Environmental Impact Report** was approved and adopted by the Mojave Water Agency. MWA is the CEQA lead agency for this EIR. The report is included with this proposal as reference material listed in Attachment 8.

The implementation of the **Mitigation Measures** during construction will be done by consultants. Biological and Cultural consultants will be contracted to do the monitoring and reporting work prior to and during construction. These consultants will also perform investigations and/or site specific surveys during the design phase of the project.

Currently the **Design** of this project is 10 % complete. Design analysis is started and major facilities have been identified and located on a site plan. The background geological and seismic literature has been reviewed. The EIR and IRWMP include project objectives and constraints.

The work for this item will start several months after the design and will be completed prior to the public bidding for the construction work.

Land Purchase: estimated acres to purchase: 10 acres for recharge ponds

Easements: estimated acres for temporary construction easements: 20 acres - pipeline

LAND FOR  
ORO GRANDE  
WASH Project.

During the initial design phase of the project, the permits required for the project will be identified. Based on the 10 % design progress to date, an initial list of permits (see below) has been developed. Some permits will require issued construction drawings be completed and reviewed by the permitting entity; these permits will be completed prior to the bidding of the construction contracts. MWA Staff, in conjunction with the Right-of-Way Consultant and Design Engineer, will obtain the permits required for the project. Several of the construction permits will be included in the construction contractor's scope of work. The construction contractor will be required to obtain the permits prior to the Notice to Proceed.

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- Various utility crossing permits
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#### **Planning / Design/Engineering / Environmental Documentation & Mitigation**

The planning for this project is completed and is part of the IRWMP.

This project has an approved and adopted **environmental document in full compliance** with CEQA and all other environmental laws.

In January 2006 an **Environmental Impact Report (EIR)** was approved and adopted by the Mojave Water Agency. MWA is the CEQA lead agency for this EIR. The report is included with this proposal as reference material listed in Attachment 8.

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Once a **Design/Engineering** Consultant is selected, the project detailed design will begin. MWA will provide oversight for the design of the project. The design consultant will use AWWA, ACI, AASHTO, AWS, ASTM and ANSI specifications for the materials and design criteria in developing the specifications for the project.

The major considerations during the **design** phase of the project will include:





The work for this item will start several months after the design and will be completed prior to the public bidding for the construction work.

Land Purchase: estimated acres to purchase: 10 acres for recharge ponds

Easements: estimated acres for temporary construction easements: 20 acres - pipeline

During the initial design phase of the project, the permits required for the project will be identified. Based on the 10 % design progress to date, an initial list of permits (see below) has been developed. Some permits will require issued construction drawings be completed and reviewed by the permitting entity; these permits will be completed prior to the bidding of the construction contracts. MWA Staff, in conjunction with the Right-of-Way Consultant and Design Engineer, will obtain the permits required for the project. Several of the construction permits will be included in the construction contractor's scope of work. The construction contractor will be required to obtain the permits prior to the Notice to Proceed.

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PERMITS REQ'D  
FOR THE  
ORO GRANDE WASH  
RECHARGE PROJECT

#### **Planning / Design/Engineering / Environmental Documentation & Mitigation**

The planning for this project is completed and is part of the IRWMP.

This project has an approved and adopted **environmental document in full compliance** with CEQA and all other environmental laws.

In January 2006 an **Environmental Impact Report (ERI)** was approved and adopted by the Mojave Water Agency. MWA is the CEQA lead agency for this EIR. The report is included with this proposal as reference material listed in Attachment 8.

The implementation of the **Mitigation Measures** during construction will be done by consultants. Biological and Cultural consultants will be contracted to do the monitoring and reporting work prior to and during construction. These consultants will also perform investigations and/or site-specific surveys during the design phase of the project.

Currently, the **Design** of this project is 10 % complete. Design analysis is started and major facilities have been identified and located on a site plan. The background geological and seismic literature has been reviewed. The EIR and IRWMP include project objectives and constraints.

Once a **Design/Engineering** Consultant is selected, the project detailed design will begin. MWA will provide oversight for the design of the project. The design consultant will use AWWA, ACI, AASHTO, AWS, ASTM and ANSI specifications for the materials and design criteria in developing the specifications for the project.

The major considerations during the **design** phase of the project will include:

of MWA's Staff with assistance from time to time from the Project Engineering firm. Once the facilities and pipeline route have been selected and the quantity of land purchased and easements required is known, MWA will obtain the services of Right-Of-Way acquisition firm to perform the land procurement and easement work. This will include appraisals, title work, surveying, plat maps, legal document preparation, and condemnation should it be required.

The work for this item will start several months after the design and be completed prior to the public bidding for the construction work.

**Land Purchase:** Estimated acres to be purchased: 100 Acres for extraction well field  
8 acres for pump & tank facilities

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- Various utility crossing permits
- Cities of Hesperia, Victorville, and Adelanto excavation permits.

PERMITS REQ'D  
FOR  
THE  
UPPER MOJAVE RIVER  
project.

#### **Planning / Design/Engineering / Environmental Documentation & Mitigation**

The **planning** for this project is completed and is part of the IRWMP.

This project has a approved and adopted **environmental document in full compliance** with CEQA and all other environmental laws. In January 2006 an **Environmental Impact Report** was approved and adopted by the Mojave Water Agency. MWA is the CEQA lead agency for this EIR. The report is included with this proposal as reference material listed in Attachment 8.

The implementation of the **Mitigation Measures** during construction will be done by consultants. Biological and Cultural consultants will be contracted to do the monitoring and reporting work prior to and during construction. These consultants will also perform investigations and/or site specific surveys during the design phase of the project.

Currently the **Design** of this project is 10 % complete. Design analysis is started and major facilities have been identified and located on a site plan. The background geological and seismic literature has been reviewed. The EIR and IRWMP include project objectives and constraints.





combined and bid in the same contract, all construction contracts will be bid at the same time, August 2007. All construction work for the project is scheduled to be completed in December 2008.

During the construction implementation the construction administration work will consist of reviewing the progress of the work in accordance with an approved project schedule. A pre- construction meeting will be held prior to the issuance of the notice to proceed. Weekly construction meetings will be held with MWA, the contractor's representative, construction management firm, and respective local entities, such as Caltrans and utility companies. The Design firm will be required to review the technical submittals required under the contract, such as concrete mix design, backfill procedures, contractor furnished material and equipment. The Construction management firm will maintain the project records and all items related to the execution of the construction contract, coordinate any outside testing required by the work, such as shop inspection.

Once the construction work is substantially completed the MWA and the CM firm will inspect the project for completion. In the event the work is not 100% complete a punch list indicating outstanding work to be completed will be provided to the contractor. Upon completion of the punch list work MWA will re-inspect the project for final acceptance. A percentage of progress payments will be held by MWA until final notice of acceptance has been issued. The completed project will be turned over to the Mojave Water Agency.

### **Monitoring & Reporting**

#### **Monitoring and Reporting – Project Design and Construction**

MWA will oversee all monitoring and reporting functions related to this project. For some of the monitoring and data collection consultants will be used to gather or report to MWA the information to support compliance, performance and quality of the various aspects of this project. For Engineering and Construction monthly detailed progress reports will be required to be submitted and will include project highlights, schedule analysis, milestone status, financial data (cost /labor/ budget vs actual), any changes, recommendations, and problems.

Immediately after the approved agreement date in May 2007, MWA will provide an updated status report for each project in the proposal. The report will include information on costs to date, project milestones, and any technical report issued between June 2006 and May 2007. MWA will also be preparing, on a quarterly basis, project reports that provide summary and detailed updates on each project. The report will include a summary project narrative, cost data, schedules, trends, problems and recommended course of action, and project photos (if appropriate). The monitoring and reporting is part of our grant work and will be completed in December 2008.

**INCLUDES ALL REPORTS**

#### **Monitoring Efforts - Operations**

Once the construction of this project is completed, MWA will continue as the responsible reporting entity. All water supply and water quality data defined by the environmental mitigation measures, PAEP and other jurisdictional agencies will be done. The first six months of implementation reporting is included in this project, January 2009 to June 2009. MWA will implement the PAEP as described in Attachment 9 in this application. These reports will directly deal with the impacts derived from the operation and/or implementation of each project. This monitoring work will be on going as long as the recharge project is in operation. Additional monitoring points will be added to address project specific data gaps.

items related to the execution of the construction contract, and will coordinate any outside testing required by the work, such as shop inspection.

Once the construction work is substantially completed, the MWA and the CM firm will inspect the project for completion. In the event the work is not 100% complete, a punch list indicating outstanding work to be completed will be provided to the contractor. Upon completion of the punch list work, MWA will re-inspect the project for final acceptance. A percentage of progress payments will be held by MWA until final Notice of Acceptance has been issued. The completed project will be turned over to the Mojave Water Agency.

## **Monitoring & Reporting**

### **Monitoring and Reporting – Project Design and Construction**

MWA will oversee all monitoring and reporting functions related to this project. For some of the monitoring and data collection, consultants will be used to gather or report to MWA the information to support compliance, performance and quality of the various aspects of this project. For Engineering and Construction, monthly detailed progress reports will be required to be submitted and will include project highlights, schedule analysis, milestone status, financial data (cost /labor/ budget vs actual), any changes, recommendations, and problems.

Immediately after the approved agreement date in May 2007, MWA will provide an updated status report for each project in the proposal. The report will include information on costs to date, project milestones, and any technical report issued between June 2006 and May 2007. MWA will also be preparing, on a quarterly basis, project reports that provide summary and detailed updates on each project. The report will include a summary project narrative, cost data, schedules, trends, problems and recommended course of action, and project photos (if appropriate). The monitoring and reporting is part of our grant work and will be completed in June 2008.

### **Monitoring Efforts - Operations**

Once the construction of this project is completed, MWA will continue as the responsible reporting entity. All water supply and water quality data defined by the environmental mitigation measures, PAEP and other jurisdictional agencies will be done. The first six months of implementation reporting is included in this project-July 2008 to December 2008. MWA will implement the PAEP as described in Attachment 9 in this application. These reports will directly deal with the impacts derived from the operation and/or implementation of each project. This monitoring work will be ongoing as long as the recharge project is in operation. Additional monitoring points will be added to address project specific data gaps.

## **Eradication of Non-Native Plant Species**

### **Direct Project Administration**

The Mojave Water Agency Staff will oversee the administration of the project. The Agency will use Staff for two positions; Project Administrator and GIS Technician. The Project Administrator will establish a specific action plan for plant eradication. The plan will tier off of the existing Weed Management Plan to develop a scope of work and bidding document to hire a company to do the plant removal and treatment work. The removal maps and plans will be prepared by the GIS Technician.





combined and bid in the same contract, all construction contracts will be bid at the same time, August 2007. All construction work for the project is scheduled to be completed in December 2008.

During the construction implementation the construction administration work will consist of reviewing the progress of the work in accordance with an approved project schedule. A pre- construction meeting will be held prior to the issuance of the notice to proceed. Weekly construction meetings will be held with MWA, the contractor's representative, construction management firm, and respective local entities, such as Caltrans and utility companies. The Design firm will be required to review the technical submittals required under the contract, such as concrete mix design, backfill procedures, contractor furnished material and equipment. The Construction management firm will maintain the project records and all items related to the execution of the construction contract, coordinate any outside testing required by the work, such as shop inspection.

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**Monitoring & Reporting** — NOT ONLY FOR REGULAR PROGRESS DURING CONSTRUCTION.

#### Monitoring and Reporting – Project Design and Construction

MWA will oversee all monitoring and reporting functions related to this project. For some of the monitoring and data collection consultants will be used to gather or report to MWA the information to support compliance, performance and quality of the various aspects of this project. For Engineering and Construction monthly detailed progress reports will be required to be submitted and will include project highlights, schedule analysis, milestone status, financial data (cost /labor/ budget vs actual), any changes, recommendations, and problems.

Immediately after the approved agreement date in May 2007, MWA will provide an updated status report for each project in the proposal. The report will include information on costs to date, project milestones, and any technical report issued between June 2006 and May 2007. MWA will also be preparing, on a quarterly basis, project reports that provide summary and detailed updates on each project. The report will include a summary project narrative, cost data, schedules, trends, problems and recommended course of action, and project photos (if appropriate). The monitoring and reporting is part of our grant work and will be completed in December 2008.

#### Monitoring Efforts - Operations

Once the construction of this project is completed, MWA will continue as the responsible reporting entity. All water supply and water quality data defined by the environmental mitigation measures, PAEP and other jurisdictional agencies will be done. The first six months of implementation reporting is included in this project, January 2009 to June 2009. MWA will implement the PAEP as described in Attachment 9 in this application. These reports will directly deal with the impacts derived from the operation and/or implementation of each project. This monitoring work will be on going as long as the recharge project is in operation. Additional monitoring points will be added to address project specific data gaps.



## Attachment 15. Modification of River or Stream Channel

Minor stream flow modifications will be required for some project elements. Generally, this will involve pipeline crossings of stream channels during the dry, non-flow season. MWA has substantial experience in permitting and mitigating such construction. Other projects will involve construction of recharge ponds in the floodplain (but outside the main flow channel) of the Mojave River and other ephemeral streams. MWA obtained a Negative Declaration on the impacts of pilot recharge ponds in the Mojave River floodplain and Oro Grande Wash in 2004.

MWA has committed to fully mitigate any stream channel impacts. In the Programmatic EIR, the Agency committed to the following mitigations<sup>1</sup> for stream channel impacts:

Impact	Comments	Mitigation Measures	Level of Significance After Mitigation
<b>Impact 3.2-5:</b> Recharge facilities located within flood plains would be periodically subject to flood conditions.	Facility Siting Impact	<p><b>M3.2-5</b> Implementing agencies shall ensure that recharge basins are equipped with storm flow bypass mechanisms that avoid damage to recharge basins, avoid flooding areas outside of the existing floodplain, and avoid detaining flood flows that have designated beneficial uses downstream.</p> <p><b>M3.2-6</b> MWA shall avoid discharging into the Mojave River during storm events that could result in flooding.</p> <p><b>M3.2-7</b> Implementing agencies shall ensure that revisions to floodplain insurance maps are submitted to the Federal Emergency Management Agency if recharge projects modify floodplains.</p>	Less than significant.
<b>Impact 3.2-7:</b> Construction of projects could degrade storm water runoff quality.	Construction Impact	<p><b>M3.2-8</b> Implementing agencies shall establish standard Best Management Practices (BMPs) for construction runoff protection during construction activities involving RWMP projects. BMPs selected for each project should be in place and operational prior to the onset of major earthwork on the site. Typical elements of a Storm Water Pollution Prevention Plan (SWPPP) include:</p> <ul style="list-style-type: none"> <li>○ Storm runoff from the construction area should be regulated through a storm water management/erosion control plan that may include temporary onsite silt traps and/or basins with multiple discharge points to natural drainages and energy dissipaters. Stockpiles of loose material should be covered and runoff diverted away from exposed soil material.</li> <li>○ Equipment wash water including concrete wash water should not be allowed to run off site.</li> <li>○ Vehicle fueling and chemical storage areas should be located within an area with adequate secondary containment.</li> <li>○ Vehicles leaving the construction site should not track dirt onto local roadways.</li> <li>○ After completion of grading, erosion protection should be provided on cut-and-fill slopes when the finished grade warrants.</li> </ul>	Less than significant.

These stream channel mitigations are further described in Chapter 3 of the Programmatic EIR<sup>2</sup>. Other adopted mitigation measures for the RWMP are summarized in the Executive Summary of the Program EIR and detailed throughout the document.

<sup>1</sup> PEIR Table ES-1 (See Section 8)

<sup>2</sup> PEIR p.3.2-33 (See Section 8)



jurisdiction must determine whether any federal-listed threatened or endangered species could be present in the project area and determine whether the proposed project would have a potentially significant impact on such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the ESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]).

The USFWS also publishes a list of candidate species. Species on this list receive "special attention" from federal agencies during environmental review, although they are not protected otherwise under the ESA. The candidate species are species for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

USFWS has completed recovery plans for four species that occur in the MWA service area:

1. Bald Eagle (August 25, 1986). Recovery of the bald eagle was addressed on a regional basis and the Pacific Bald Eagle Recovery Plan presented criteria for downlisting to threatened status, which were achieved in 1994. Many of the eagles wintering at Lake Silverwood, Lake Arrowhead, and Big Bear Lake utilize a night roost at Las Flores Ranch. This property is included in the Summit Valley Habitat Conservation Plan (HCP) that is being prepared by the City of Hesperia.
2. Desert Tortoise (June 28, 1994). Substantial portions of the MWA service area provide habitat.
3. Mojave Tui Chub (September 17, 1984). The fish is maintained at small refugia at China Lake NAWS, Zyzzyx, and Camp Cady. Camp Cady is located within the MWA service area.
4. California Red-Legged Frog (May 28, 2002). The Forks of the Mojave River is a core area for the frog.

Recovery Plans for the Least Bell's vireo, southwestern willow flycatcher, and carbonate endemic plants have been published in draft format and are awaiting public comment and finalization by the USFWS.

#### ***CLEAN WATER ACT (CWA) (SECTION 404)***

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance and sensitivity of wetlands has increased as a result of a growing understanding of their function as recharge areas and filters for water supplies. Following is the federal definition of a wetland.

#### **U.S. Army Corps of Engineers (Corps) Wetland Definition**

Wetlands are a subset of "waters of the United States" and receive protection under Section 404 of the CWA. The term "waters of the United States" defined in the Code of Federal Regulations (CFR) (33 CFR 328.3[a]; 40 CFR 230.3[s]) includes:

Impacts to habitats would differ for each project depending on the location and the flexibility to modify locations to avoid impacting sensitive species. Subsequent review for each project would determine the significance and mitigation strategy appropriate for each project. In general, the following mitigation strategy would ensure that impacts to sensitive habitats would be less than significant.

### Mitigation Measures

**M3.3-1**      **Implementing agencies shall implement a mitigation strategy first to identify sensitive habitats in the project area and then to avoid impacts if possible. If avoidance is not possible, MWA shall minimize the impact and compensate in accordance with permitting requirements. The mitigation strategy is summarized below:**

**Determine if Sensitive Habitats are Present.** The implementing agency would retain a qualified botanist to conduct a detailed survey of habitat types present at each project site. The botanist would determine if sensitive habitats are present and delineate their extent on a map of the project area. If sensitive habitats are present, the implementing agency would attempt to avoid the impact as described below. If avoidance is not possible, then measures to minimize and compensate for loss would be implemented.

**Avoid Loss of Sensitive Habitats.** The implementing agency would avoid disturbing sensitive habitats if possible. Because desert wash and desert riparian typically occur over small localized areas, they could likely be avoided during project siting and design. Sensitive areas would be fenced and signs posted to restrict access during construction and, if necessary during project operation. If avoidance is not feasible, then measures to minimize and compensate for loss would be implemented.

**Minimize Loss of Sensitive Habitats.** The implementing agency would limit construction activities in and around sensitive habitats to the minimum area necessary. Construction zones would be clearly delineated and marked on the ground to avoid inadvertent unnecessary encroachment. Construction activities would be monitored by a biologist to ensure that impacts to sensitive areas are minimized. In addition, measures to compensate for loss of sensitive habitats would be implemented.

**Compensate for Unavoidable Loss of Sensitive Habitats.** If impacts to sensitive habitats could not be avoided, the implementing agency would compensate for the unavoidable loss of sensitive habitats. Compensation would involve either purchasing property with similar habitat and providing for its protection and management for wildlife value in perpetuity, or enhancing habitat values of existing conservation areas. Detailed restoration plans would be developed before project implementation for each sensitive community to be



replaced and would fully compensate for unavoidable losses. The long-term objective of the plans would be to ensure no net loss of sensitive habitats and that sensitive habitats are replaced in-kind. If the implementing agency replaces sensitive habitats that are lost or disturbed, a suggested compensation ratio from 1:1 to 3:1 is often recommended by the CDFG and/or USFWS, depending on the success expected in creating a particular habitat. However, the ratio may be increased by a resource agency depending if threatened or endangered species are being mitigated (see Impacts 3.3-3 and 3.3-5 below).

Compensation could be accomplished through conservation area management mechanisms established by the West Mojave Plan or by other means. Restoration sites would be established that would support the hydrologic, topographic, and other physical features necessary to support the affected habitats and associated species. Restoration and monitoring would be accomplished by qualified professionals with experience in arid lands, wetland restoration, and wildlife habitat needs. Performance standards for evaluating the success of restoration efforts would be determined in consultation with the resource agencies that have jurisdiction over the resources being restored. These resource agencies would include the Corps, CDFG, and USFWS. Minimum performance standards for vegetative cover, species diversity, and plant vigor would be determined; generally, restoration efforts are designed so that performance standards are met five years after project construction activities are complete.

#### **Significance After Mitigation**

Less than significant.

#### **Impact 3.3-2: Construction could result in the potential loss of common habitats.**

Construction of projects could result in the loss of common habitats and associated biological communities from facility construction. Common habitats include desert scrub, agricultural lands, barren areas, and tamarisk scrub. This impact is considered less than significant because these habitats are common and do not support sensitive species.

#### **Mitigation Measures**

None Required.

#### **Significance After Mitigation**

Less than significant.

#### **Impact 3.3-3: Projects could result in the loss of special-status plant species.**

A project could eliminate special-status plant species. Direct impacts could occur from basin and facility construction, flooding, vehicle traffic, foot traffic, and the placement of construction materials on special-status plant populations. The loss of special-status plant species is considered a significant impact. In general, the following mitigation strategy would ensure that impacts to special status plant species would be less than significant.

### **Mitigation Measures**

**M3.3-2**      **The implementing agency shall implement a mitigation strategy first to identify sensitive plants within the project area and then to avoid impacts if possible. If avoidance is not possible, the implementing agency shall minimize the impact and compensate in accordance with permitting requirements. This mitigation strategy is summarized below.**

**Conduct Site-Specific Special-Status Plant Species Surveys and Avoid Known Populations.** Surveys for special-status plant species are necessary to determine their status in the appropriate habitats at the project sites. Habitat types present at the sites would be identified and the potential for special-status plant species determined. The implementing agency would conduct surveys during the period of identification for each species potentially present, usually late winter or spring (Appendix D). If special status plant species are found, the following mitigation measures, listed in order of preference, would be implemented.

**Avoid Loss of Special-Status Plant Species.** The implementing agency would avoid special-status plants during project implementation if possible. During project siting efforts, alternative locations or project configurations would be evaluated. As determined by a qualified botanist, populations would be fenced and signs posted to restrict activities in the area. Certain plants may be moved from the construction area and replanted in protected areas. If plants are moved, long term monitoring would be necessary to ensure survival. Plans to move sensitive plants would require approval from the appropriate resource management agency such as CDFG or USFWS. Implementation of this mitigation measure would reduce the impact to less than significant. However, if the loss of special-status plant species is unavoidable, the following measure would be implemented.

**Minimize Loss of Special-Status Plant Species.** The implementing agency would limit construction activities in and around special-status plant communities to the minimum area necessary so that sufficient populations remain that are self-sustaining and viable. The remaining populations should be protected and avoided. Populations would be delineated on project area maps and marked on the ground. Construction activities would be monitored by a qualified biologist to ensure that sensitive areas are avoided.

**Compensate for Unavoidable Loss.** Replacement of special-status plant communities would provide amounts of habitat values to plants equivalent to those present before project implementation. Replacement could involve either purchasing property with known populations of the threatened plant and providing protection and management for habitat value in perpetuity or enhancement. Enhancement could include replanting the species from the impacted seed stock. Detailed restoration plans would be developed before project implementation for each special-status plant community to be replaced and would fully compensate for unavoidable losses. The plans would be approved by CDFG or USFWS as appropriate. The long-term objective of the plans would be to ensure no net loss of special-status plant species and that the communities are replaced in-kind at a minimum ratio as described above. Mitigation for unavoidable losses would be determined in consultation with the resource agencies.

Restoration or creation sites would be chosen that would support the hydrologic, topographic, and other physical features that are specified in a detailed compensation plan that would be required to implement this measure. Preferably, restoration or creation sites should be near the area of habitat loss.

The restoration and monitoring plan would be prepared by a qualified botanist with experience in arid lands and wetland restoration. Minimum performance standards for vegetative cover, species diversity, and plant vigor that should be present five years after project construction activities have been completed would be included in the monitoring plan so that successful restoration is defined.

### Significance After Mitigation

Less than significant.

#### **Impact 3.3-4: Construction of projects could result in impacts to federal or state listed wildlife species. Impacts could include habitat loss, disturbance, or direct mortality.**

Implementing a project could eliminate potential habitat for the desert tortoise and the Mohave ground squirrel. Both of these species are listed as "umbrella species"<sup>25</sup> in the West Mojave Plan<sup>26</sup>. A project could disturb areas used for breeding, cover, or other activities or cause direct mortality of individual animals. Impacts to listed species, including loss of habitat, would be considered significant. The desert tortoise is a federal and state listed threatened species; the

<sup>25</sup> "Umbrella species" is a term used to describe protection of many other species under the "umbrella" of conservation for important wide-ranging species. The desert tortoise and Mohave ground squirrel habitat are used to preserve diverse and unique elements of the western Mojave Desert flora. These include Mojave monkeyflower, Barstow woolly sunflower, desert cymopterus, and Lane Mountain milkvetch.

<sup>26</sup> Bureau of Land Management (BLM), County of San Bernardino, and City of Barstow, *Draft Environmental Impact Report and Statement for West Mojave Plan – A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment*, Bureau of Land Management, California Desert District, Moreno Valley, California, 2003



Mohave ground squirrel is a state threatened species. In general, implementing agencies would reduce the level of significance of this impact by utilizing the following mitigation strategy.

### Mitigation Measures

#### M3.3-3

**The implementing agency shall survey affected areas for listed species and attempt to avoid impacts to listed species if possible. If avoidance is not possible, then compensation through the permitting requirements in the Endangered Species Act would be required. This mitigation strategy is summarized below:**

**Conduct Pre-Construction Surveys.** The implementing agency would conduct pre-construction biological surveys of prospective construction areas to determine the potential for encountering state or federal listed species. Potentially impacted protected species may include the desert tortoise, the arroyo toad, California red-legged frog, Swainson's hawk, western yellow-billed cuckoo, least Bell's vireo, and Mohave ground squirrel. If the surveys conclude that a listed species could use the site for nesting or foraging, the following mitigation measures would apply.

If these species are not found in the affected area, then no additional mitigation measures would be required. If one or more of these species are present in the affected area, then the implementing agency would implement the following measures.

**Select Project Location to Avoid Affecting Wildlife Species.** The implementing agency would avoid constructing facilities where these species occur. The implementing agency would contact USFWS and CDFG to determine the location and width of the buffer zone, if one is needed. If these species or their habitats cannot be avoided during construction, then the implementing agency would implement the following measure.

**Develop and Implement a Mitigation Plan That Complies with Federal and State ESA.** The implementing agency would develop and implement a mitigation plan for each species or groups of species with similar habitat requirements. For species that are federally listed or proposed for listing as threatened or endangered, the implementing agencies must comply with permitting requirements of the federal ESA. If no federal agency is involved with the project, the implementing agency would initiate consultation pursuant to Section 10(a) of the federal ESA, and prepare a HCP. The HCP would include measures that would minimize impacts to threatened or endangered species and measures for replacing habitat for these species.

For species that are state listed as threatened or endangered, the implementing agency would consult with CDFG. The implementing agency would negotiate

with CDFG to compensate for the loss of habitat and possible take of a state-listed species. This would require CDFG and the implementing agency to enter into a California Fish and Game Code 2081 management agreement.

**Comply with the Desert Tortoise (Mojave Population) Recovery Plan.** For areas where desert tortoise may be encountered, the implementing agency would comply with procedures prepared by USFWS to protect the desert tortoise (USFWS, 1994). This would include providing a habitat conservation plan to compensate for disturbance in compliance with Section 10(a)(1)(B) of the federal ESA. The implementing agency would perform the tasks described below.

The implementing agency would retain a qualified biologist to conduct preconstruction clearance surveys for desert tortoises and tortoise signs over the entire affected area and the zone of influence adjacent to the affected area (proposed groundwater recharge basins and associated staging areas). The purpose of the survey would be to locate and remove tortoises from the affected area to avoid or minimize death or injury of desert tortoises that could be caused by project implementation. A clearance survey would require 100 percent coverage of the affected area, and would focus on locating all desert tortoises above and below ground. This survey would be conducted immediately before surface disturbance of the affected area. Burrows occupied by tortoises would be hand-excavated by "authorized biologists."<sup>27</sup> Tortoises found during clearance surveys would be relocated to appropriate habitat locations to be determined by the USFWS and CDFG. Specific methods of relocating tortoises would be determined by the USFWS and CDFG.

The implementing agency would fence the recharge basins and canals in the areas of suitable tortoise habitat to prevent desert tortoises from entering the basins. The implementing agency would contact CDFG and USFWS to determine the appropriate type of fencing to exclude tortoises from the recharge basin areas. The implementing agency would also comply with additional measures required during Section 10(a) consultation with USFWS and consultation with CDFG.

### **Significance After Mitigation**

Less than significant.

**Impact 3.3-5: Construction of projects could result in direct or indirect loss of wildlife species designated as candidates for federal listing as threatened or endangered or designated as state species of special concern.**

<sup>27</sup> An "authorized biologist" is defined as a wildlife biologist who has been authorized to handle desert tortoises by the USFWS and CDFG for the project.

Implementing the projects could eliminate potential habitat for or cause substantial loss of individual animals including the following:

- Burrowing Owl
- Bendire's Thrasher
- Prairie Falcon
- Yellow-Breasted Chat
- Gray-Headed Junco
- Brown-Crested Flycatcher
- Ferruginous Hawk
- Le Conte's Thrasher
- Pallid Bat
- Townsend's Big-Eared Bat
- Merlin
- Cooper's Hawk
- Long-Eared Owl
- Yellow Warbler
- Summer Tanager
- Vermilion Flycatcher
- Gray Vireo
- Southwestern Pond Turtle
- San Diego Horned Lizard
- Two-Striped Garter Snake
- Mojave River Vole

This impact is considered significant because these species are sensitive species of concern. The mitigation strategy would be to minimize the potential for mortality of these species. This would be accomplished by conducting pre-construction surveys and by avoiding nesting season.

#### Mitigation Measure

**M3.3-4**      **The Implementing agency shall consult with California Department of Fish and Game(CDFG) and the US Fish and Wildlife Service (USFWS) to implement a mitigation strategy first to identify sensitive species within the project area and then to avoid impacts if possible. If avoidance is not possible, the implementing agency shall minimize the impact and compensate in accordance with permitting requirements. This mitigation strategy is summarized below:**

**Conduct Preconstruction Surveys.** Before construction of any facilities, the implementing agency would conduct surveys in the affected area to determine whether these species are occupying the site. If no such species occur in the affected area, no additional mitigation measures are required. If any of these species is present, the implementing agency would consult with CDFG.

**Consult with CDFG and Implement Recommendations.** The implementing agency should consult with CDFG to determine the appropriate measures for mitigating the loss of habitat for each species, if necessary, and relocating or preventing each species from entering the project site before project construction.

**Conduct Nesting Surveys before Construction.** Preconstruction surveys should be conducted during the peak of the breeding season (March 15-June 15). If sensitive species are not nesting in the affected area, then no additional mitigation is required. If they are nesting in the affected area, the implementing



agency would conduct pre-construction surveys. Implementation of the following mitigation measure would reduce this impact to less than significant.

**Avoid Construction during the Nesting Season.** The implementing agency would avoid nesting failure by constructing the project elements during the nonbreeding season (August 15-March 15).

#### **Significance After Mitigation**

Less than significant.

#### **Impact 3.3-6: Construction and operation of projects could disturb nesting raptors.**

Noise or direct activities from the construction of recharge basin facilities could disturb nesting raptors (e.g., Swainson's hawk, red-tailed hawk, and great horned owl), which are protected by the federal Migratory Bird Act. This impact is considered significant. In general, the following mitigation strategy would ensure that impacts to raptors would be less than significant.

#### **Mitigation Measure**

**M3.3-5** The implementing agency shall conduct pre-construction surveys to identify nesting raptors within the project area. If nesting raptors are identified, construction activities will be timed to avoid impacting the nest. This strategy is summarized below.

**Conduct Preconstruction Surveys for Nesting Raptors.** The implementing agency would commission preconstruction surveys for active raptor nests from March to June. The surveys would be conducted prior to construction.

**Construction Timing Restrictions.** If active nests are found, the implementing agency would maintain a buffer zone (possibly 300 feet in radius) around raptor nests while they are occupied or postpone construction activities until after raptor breeding season (August 15-January 15).

#### **Significance After Mitigation**

Less than significant.

#### **Impact 3.3-7: Elevated groundwater levels could enhance riparian habitats and wetland vegetation.**

Riparian vegetation in the MWA service area is currently in a state of decline due to groundwater overdraft conditions. Recovery of groundwater levels could reverse these declines and could result in an increase in the extent of riparian habitat beyond that currently required by performance standards in the stipulated judgment and the CDFG mitigation fund. Similar effects

## Exhibit H

Excerpts from Bookman Edmonston Technical Memorandum - Upper Mojave River Well Field and Water Supply Pipeline Project documenting the phased installation of wells.

Table 2 shows the project facilities in three construction stages for consideration by the Agency. We have used 15% for engineering and administration on all stages however; this percentage may increase or decrease depending upon the complexity and timing of various elements.

Table 2  
Upper Mojave River Well Field and Water Supply Pipeline Project - R<sup>1</sup> Project  
Estimated Capital Cost for 36-inch Diameter Pipeline at 2006 Price Level

	Stage 1	Stage 2	Stage 3
<b>Spreading Facility at "East Side Site" (APN: 043306133 &amp; 108)</b>			
Spreading Grounds (net area 64 acres, structures, dike construction, clearing)	\$ 200,000		
Pipeline (7,200 lf., 42-inch diameter, 74 cfs, 8 fps)	\$ 2,419,000		
Connection/turnout @ Morongo Basin Pipeline	\$ 100,000		
<b>Mojave River Well Field and Collection Pipeline</b>			
Production Wells (5 wells @ 3 cfs each, depth 500', 90 hp)	\$ 3,750,000		
Production Wells (8 wells @ 3 cfs each, depth 500', 90 hp)		\$ 6,000,000	
Production Wells (9 wells @ 3 cfs each, depth 500', 90 hp)			\$ 6,750,000
Monitoring Wells (5 pairs, 2-in casing, Depth 500 ft. & bottom of Mojave R Aquifer.)	\$ 350,000		
Collection Pipeline (7,430 lf., various diameters)	\$ 1,230,000		
Collection Pipeline (11,900 lf., various diameters)		\$ 1,960,000	
Collection Pipeline (13,380 lf., various diameters)			\$ 2,210,000
<b>Pump Stations and Storage Facilities</b>			
Pumping Plant 1 (420 TDH 66 cfs, 4,000 hp)	\$ 2,920,000	\$ 540,000	\$ 540,000
Tank Site 1 (1 tank @ 1 hr storage for 66 cfs = 2.0 MG)	\$ 1,000,000		
Tank Site 1 (1 tank @ 1 hr storage for 66 cfs = 2.0 MG)		\$ 1,000,000	
Pumping Plant 2 (420 TDH, 66 cfs, 4,000 hp)	\$ 2,920,000	\$ 540,000	\$ 540,000
Tank Site 2 (1 tank @ 1 hr storage for 66 cfs = 2.0 MG)	\$ 1,000,000		
Tank Site 2 (1 tank @ 1 hr storage for 66 cfs = 2.0 MG)		\$ 1,000,000	
<b>Conveyance Pipeline (66 cfs)</b>			
Pumping Plant 1 to Pump Station 2 (21,700 lf of 36-inch)	\$ 6,250,000		
Turnout No. 1 (CSA64, 16-inch blind flange)	\$ 1,280		
Turnout No. 2 (VVWD Turnout 1, 24-inch tee w/ blind flanged)	\$ 1,920		
Pumping Plant 2 to Turnout No. 3 (11,320 lf of 36-inch)	\$ 3,260,000		
Turnout No. 3			
VVWD Turnout 2 (8,000 gpm meter vault & 5,600 lf of 24-inch)	\$ 1,115,200		
Hesperia Turnout 1 ( stub 24-inch w/blind flange)	\$ 1,920		
Turnout No. 3 to Turnout No. 4 (BMWD, 12,900 lf 36-inch, 30,000 gpm meter vault)	\$ 3,835,200		
<b>Tunneling Cost</b>			
RR Crossing (200 lf of tunneling)	\$ 200,000		
I-15 Crossing ( 350 lf of tunneling)	\$ 350,000		
Oro Grande (800 lf of tunneling)	\$ 800,000		
<b>Bare Construction Cost=</b>	<b>\$ 31,705,000</b>	<b>\$ 11,040,000</b>	<b>\$ 10,040,000</b>
with 20% Contingency	\$ 38,046,000	\$ 13,248,000	\$ 12,048,000
15% Engineering & C.M, Administration and Legal	\$ 5,706,900	\$ 1,987,200	\$ 1,807,200
Land Purchase for Spreading Grounds (100 acres @ \$30,000 per acre)	\$ 3,000,000		
Land Purchase for 2 Pumping stations, 2 tank sites, and Wells (8 acres @ \$100,000 per acre)	\$ 800,000		
<b>Total Estimated Capital Cost=</b>	<b>\$ 47,552,900</b>	<b>\$ 13,248,000</b>	<b>\$ 12,048,000</b>





## Memorandum of Understanding Mojave Weed Management Area

### I. Introduction

Weed infestations in the Mojave Desert in California reduce the biological, agricultural, recreational, and economic value of the land and negatively impact the environment by suppressing native plant species. A coordinated approach among Federal, State and local agencies will improve the effectiveness of weed management efforts in the Mojave Desert. Weed management efforts may include site identification, public education, and mechanical, biological, chemical, and cultural control.

SB 1740 authorized funding for the implementation of Integrated Weed Management Plans submitted by county-based Weed Management Areas (WMAs), and to assist the WMAs garner additional monetary contributions and in-kind support for integrated weed management.

For the purpose of this document, a weed is a plant species that is detrimental or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate.

To facilitate planning and implementation of educational and control programs, representatives from the partner agencies developed a list of target species within the Mojave Weed Management Area (MWMA). These species are:

Camel thorn	<i>Alhagi camelorum</i>
Dalmation toadflax	<i>Linaria dalmatic</i>
Fountain grass	<i>Pennisetium setaceum</i>
Giant reed	<i>Arundo donax</i>
Halogeton	<i>Halogeton glomeratus</i>
Puncture vine	<i>Tribulus terrestris</i>
Red Brome	<i>Bromus madritensis</i>
Russian thistle	<i>Salsola tragus</i>
Saharan mustard	<i>Brassica tournefortii</i>
Saltcedar	<i>Tamarix ramosissima</i>
Tree of Heaven	<i>Ailanthus altissima</i>
White horenettle	<i>Solanum elaeagnifolium</i>
Yellowstar thistle	<i>Centaurea solstitialis</i>

Saharan mustard is rapidly spreading throughout the Mojave Desert, and saltcedar continues to adversely affect hydrology and displace native vegetation in riparian areas; therefore, these two species are the focus of initial control actions for the MWMA. However, weed control activities are not limited to only species on the target list. The list will be used to help prioritize weed projects, and will be modified as needed. Partner

## **Mojave Weed Management Area - MOU**

agencies shall have the opportunity to review and comment on the proposed modifications to the list.

### **II. Purpose**

The purpose of this Memorandum of Understanding (MOU) is to establish the MWMA to facilitate the cooperation and coordination necessary to prevent and control weeds throughout the Mojave Desert in California. The emphasis of MWMA activities shall be on the exclusion, detection, eradication, and suppression of weeds. The priority for control and eradication efforts shall be on the species listed as noxious weeds by the California Department of Food and Agriculture and other species of local significance as they are identified. The signatory agencies and organizations will cooperate in developing coordinated work plans and seeking funds to support the activities of the MWMA. In addition, public education on weed identification, prevention, and control will be a primary goal of the MWMA. This MOU is limited to issues pertaining to weed control and management in the Mojave Desert, California.

### **III. Authority**

California Senate Bill 1740 created the Noxious Weed Management Account in the Department of Food and Agriculture Fund. The Bill authorized and appropriated funds for WMAs to use to control and abate noxious weeds according to approved integrated weed management plans, conduct research on the biology, ecology, or management of noxious and invasive weeds, and administer WMA activities.

Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.)

Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)

Executive Order 13112 (Invasive Species) February 3, 1999

Wildlife Habitat Incentive Program, Federal Improvement and Reform Act of 1996, PL 104-127; Food Security Act of 1985, as amended, 16 USC 3830 et seq. Activities under this MOU will improve wildlife habitat through the removal of invasive plant species allowing native vegetation to reestablish.

### **IV. Geographic Scope**

The geographic scope of the MWMA includes the portion of San Bernardino County in the Mojave Desert Resource Conservation District, the portion of Inyo County east of Death Valley National Park, all of Death Valley National Park, and all of Joshua Tree National Park.



- A few small tamarisk plants were removed from Deep Creek in mid-1990s by USFS.
- Fisheries Resource Volunteer Corps (FRVC) are provided with information on tamarisk and asked to look for it during patrols of Deep Creek.
- FRVC and USFS will continue to monitor for tamarisk in Deep Creek.

Bureau of Land Management – the Barstow Field Office Ten-Year Plan includes active control and maintenance of:

- Saltcedar on approximately 700 acres in the Afton Canyon area of the Mojave River.
- Saltcedar on approximately 540 acres along the Amargosa Drainage.
- Saltcedar on approximately 20 acres along Salt Creek.
- Saltcedar on approximately 50 acres surrounding the East Cronese Dry Lake.
- Saltcedar on approximately 20 acres at the Point of Rocks reach of the Mojave River.
- Saltcedar on approximately 50 acres at Harper Dry Lake.
- Small infestations on public land of upland weeds, including sahara mustard, five-hook bassia, camel thorn, African rue, tree-of-heaven, yellow-spined thistle, and malta star thistle.
- Small infestations on public land of giant reed, when discovered.

Funding and Finance

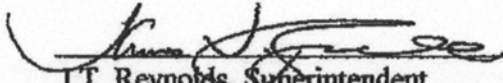
Funding for all phases of weed management is chronically inadequate. The current rate of spread of major weeds, and the introduction of new species, is far out-stripping our ability to contain them. The problem is most acute in counties with sparse populations and small private land bases, resulting in a low tax base. Furthermore, federal funding is still far from sufficient to deal with the extent and scope of the problem on the nearly 8.5 million acres of federal land in the MWMA. Beyond state appropriated funds, a large pool of available grant money exists. Grant funds are not typically targeted specifically for weed projects, but can be tapped in to by encompassing weed control into larger watershed and restoration level projects.

MWMA cooperating members are another source of funding. Many partners have in-kind support in the form of control equipment, educational materials, computer and printing capabilities, and a variety of unique expertises. While large-scale projects require considerable funding, the MWMA can achieve many educational, inventory and mapping, and limited control objectives by drawing on resources within the MWMA group.

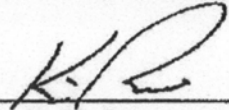
**Action:** MWMA Funding and Finance actions include:

- Grants – Beyond SB1740 funds, the MWMA will submit proposals for at least two grants each year. Each grant will target one project designated by the MWMA partners.
- Assessment of In-Kind Resources – To continually recognize resources available within the MWMA, members will be surveyed as to what in-kind contributions could be made to complete new projects.
- MWMA Program Coordinator – The MWMA Program Coordinator is responsible for arranging/recording meetings, maintaining records, preparing/managing grant proposals, maintaining the MWMA website and GIS, and performing other administrative/project tasks. The MDRCD has provided part-time funding for this position; however, the MDRCD does not have the financial resources to support this position indefinitely. The MWMA partners

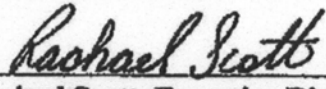
Mojave Weed Management Area - MOU

  
J.T. Reynolds, Superintendent  
Death Valley National Park

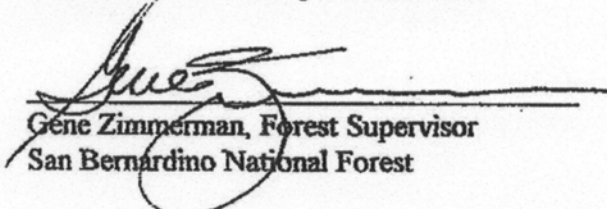
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Date

  
Kirby Brill, General Manager  
Mojave Water Agency

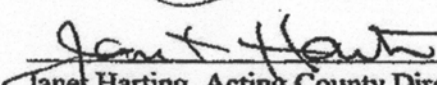
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Rachael Scott, Executive Director  
San Bernardino County Farm Bureau

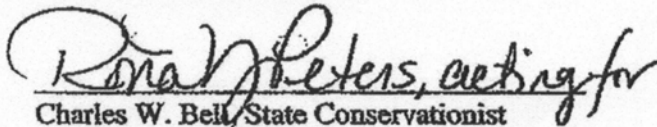
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Gene Zimmerman, Forest Supervisor  
San Bernardino National Forest

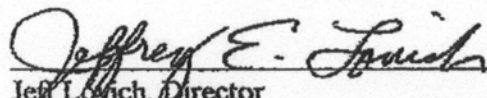
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Janet Harting, Acting County Director  
US Cooperative Extension

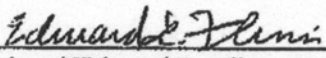
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Date

  
Charles W. Bell, State Conservationist  
USDA Natural Resources Conservation Service

8/22/02  
Date

  
Jeff Lovich, Director  
Western Ecological Research Center  
US Geological Survey

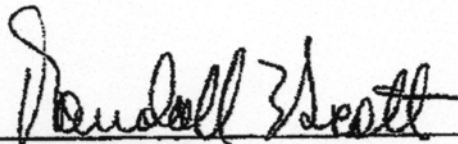
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Colonel Edward L. Flinn, Deputy Commander and Chief of Staff  
NTC, Fort Irwin

19 Sep 02  
Date

Mojave Weed Management Area - MOU

Mojave Weed Management Area - MOU



Randall E. Scott  
Director, Plans and Programs  
Edwards Air Force Base

10 Oct 02

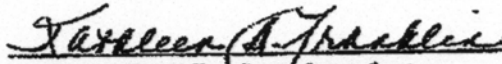
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Richard Doyle, Deputy District Director  
Planning and Local Assistance, District 8  
California Department of Transportation

7/29/02

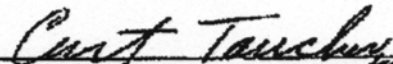
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Kathleen Franklin, Superintendent  
Mojave Desert Sector  
California State Parks

8/1/02

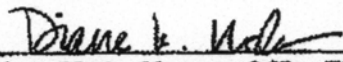
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Curt Taucher, Regional Manager  
California Department of Fish & Game

7/29/02

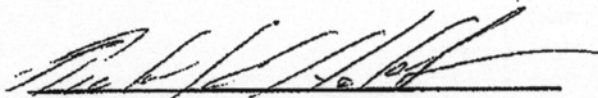
Date



Diane Noda, Ventura Office Field Supervisor  
US Fish & Wildlife Service

9/17/02

Date



Richard Haldeman, Regional Director  
Quail Unlimited

Aug 28, 2004

Date



## Exhibit J

Excerpts from the Technical Study to Evaluate a Potential Long-Term Water Management Program Between The Mojave Water Agency and Metropolitan Water District regarding detailed analysis of annual operational costs for the Oro Grande Wash Recharge Ponds North of Aqueduct and Upper Mojave River Well Field and Water Supply Pipeline Project.

#### 7.4.1 Annual Cost Evaluations

Tables 7-13 through 7-15 show a probable *put* and *take* scenario for each Program. Some of the costs for certain alternatives (the Upper Mojave River Well Field and Water Supply Pipeline) were reduced by a percentage of the total cost (in this case, 50 percent) because they are expected to be constructed jointly with the help of local agencies and possibly with some grants from the State of California. For cost comparisons, the equivalent annual costs in dollars per acre-foot of *take* were calculated in Tables 7-13 through 7-15 for the Programs using entitlement exchange. The Programs were evaluated using a present-worth calculation over 30 years, 5 percent interest, and 5 percent debt service.

The equivalent annual cost per acre-foot for the 450,000, 300,000, and 225,000 acre-foot Programs are \$410, \$360, and \$260, respectively. Similar annual costs were calculated for the same projects only no entitlement exchange was used. The result was higher capital and operation costs. The cost comparisons are shown in Table 7-16.

**Table 7-16**  
**Comparison of Equivalent Annual Cost of Selected Programs**  
**with and Without Entitlement Exchange**

Total Stored Volume (acre-foot)	Equivalent Annual Cost per Acre-Foot of Take	
	Without Entitlement Exchange	With Entitlement Exchange
225,000	\$360	\$260
300,000	\$480	\$360

T1 (Mojave River Pipeline)	\$/Acre-foot	\$178
T4 (Oeste)	\$/Acre-foot	\$178
T0 (Small new local projects)	\$/Acre-foot	\$187
T3 (Upper Mojave River Well Field and Water Supply Pipeline Project w/ south of Rock Springs Spreading Grounds)	\$/Acre-foot	\$154
Project capital cost subsidizing Upper Mojave River Well Field and Water Supply Pipeline Project (T3)	%	50%

<sup>†</sup>Includes power for pumping at \$0.12 per kilowatt-hour.

Table 7-15. Estimated Annual Cost for 225,000 Acre-Foot Program

ASSUMPTIONS: Maximum Entitlement Exchange of 20,500 for 30 years														
Total Bank Volume Is 225,000 AF														
PW Interest= 0.05 Debt Service Interest= 0.05 n= 30														
Year	Assessed Water Supply					Operation (2005 \$)					Capital (2005 \$)			
	Put (AF) (9 months)	Direct Take (10 months)	Entitlement Exchange	Storage (AF)	Existing Spreading Grounds Maintenance	Put	Take	Put	Take	Put	Take	Put	Take	Total Annual Cost \$
1	-	-	-	-	-	-	-	13,400,000	-	871,689	-	871,689	-	871,689
2	75,000	-	-	67,500	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
3	-	24,500	20,500	22,500	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
4	75,000	-	-	90,000	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
5	-	24,500	20,500	45,000	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
6	-	-	-	45,000	42,000	-	-	-	-	871,689	2,100,247	2,971,937	-	2,971,937
7	-	24,500	20,500	-	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
8	75,000	-	-	67,500	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
9	-	24,500	20,500	22,500	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
10	75,000	-	-	90,000	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
11	-	24,500	20,500	45,000	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
12	75,000	-	-	112,500	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
13	-	-	-	180,000	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
14	-	24,500	20,500	135,000	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
15	-	24,500	20,500	90,000	42,000	-	4,000,000	-	-	871,689	2,100,247	3,379,937	-	3,379,937
16	-	-	-	90,000	42,000	-	-	-	-	871,689	2,100,247	2,971,937	-	2,971,937
17	-	-	-	90,000	42,000	-	-	-	-	871,689	2,100,247	6,971,937	-	6,971,937
18	-	24,500	20,500	45,000	42,000	-	4,000,000	-	-	871,689	2,100,247	3,379,937	-	3,379,937
19	-	-	-	45,000	42,000	-	-	-	-	871,689	2,100,247	2,971,937	-	2,971,937
20	75,000	-	-	112,500	42,000	408,000	-	-	-	871,689	2,100,247	6,971,937	-	6,971,937
21	-	24,500	20,500	67,500	42,000	-	4,000,000	-	-	871,689	2,100,247	3,379,937	-	3,379,937
22	-	-	-	135,000	42,000	408,000	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
23	75,000	-	-	135,000	42,000	-	-	-	-	871,689	2,100,247	2,971,937	-	2,971,937
24	-	-	-	202,500	42,000	408,000	-	-	-	871,689	2,100,247	6,971,937	-	6,971,937
25	-	-	-	202,500	42,000	-	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
26	-	-	-	202,500	42,000	-	-	-	-	871,689	2,100,247	2,971,937	-	2,971,937
27	-	24,500	20,500	157,500	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
28	-	-	-	157,500	42,000	-	-	-	-	871,689	2,100,247	3,379,937	-	3,379,937
29	-	24,500	20,500	112,500	42,000	-	4,000,000	-	-	871,689	2,100,247	2,971,937	-	2,971,937
30	-	24,500	20,500	67,500	42,000	-	4,000,000	-	-	871,689	2,100,247	6,971,937	-	6,971,937
Totals=	675,000	540,000	246,000	2,835,000	1,218,000	3,672,000	48,000,000	13,400,000	31,800,000	26,150,677	60,907,174	138,729,851	\$	260.00

For the 75,000 AF of Put: 61,000 AF in Mojave River, 14,000 AF in Existing spreading grounds.  
On all Take years, first 20.5k AF entitlement exchange, and 24.5k AF from 13.



## Exhibit K

Excerpts from the submitted IRWMP and updated UWMP (2005) documenting how the proposed water supply projects submitted in the Step 2 application would “alleviate the basin overdraft”.

statement of what should be accomplished through the RWMP Update. The performance measures provide a set of indicators that can be used to help decide how effectively possible alternatives solutions provide the desired outcomes.

## Basin Management Objectives

The Fundamental Basin Management Objectives developed with the TAC are presented below. The objectives established for the Mojave Water Agency Regional Water Management Plan (MWA RWMP) through 2020 are to:

Balance future water demands with available supplies recognizing the need to:

- stabilize the groundwater basin storage balance over long-term hydrologic cycles
- protect and restore riparian habitat areas as identified in Exhibit H of the Mojave Basin Area Judgment and the Department of Fish & Game management plan required by Exhibit H
- limit the potential for well dewatering, land subsidence, and migration of poor quality water
- maintain a sustainable water supply through extended drought periods; and
- select projects with the highest likelihood of being implemented.

Maximize the overall beneficial use of water throughout MWA by:

- supplying water in quantity and of quality suitable to the various beneficial uses
- addressing at a minimum Table 7-1 issues throughout the MWA service area recognizing the interconnection and interaction between different areas
- distributing benefits that can be provided by MWA in an equitable and fair manner
- ensuring that costs incurred to meet beneficial uses provide the greatest potential return to beneficiaries of the project(s)
- avoiding redirected impacts; and
- identifying sustainable funding sources including consideration of affordability.

Balancing future water demands with available supplies will increase water supply reliability by preventing continued overdraft of the groundwater. With groundwater storage stabilized, there will be groundwater available during surface water supply shortages and delivery interruptions. With a balanced basin, groundwater elevations will be relatively stable and be kept above historic low. This will reduce the potential for land subsidence and associated aquifer compaction. By limiting migration of poor quality water, available supplies will be of sufficient quality to meet drinking water objectives, thereby increasing long-term water supply reliability.

**Table 5-15(s): Average Annual Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)**

	2005	2010	2015	2020	2025	2030
<b>Mojave Basin Area</b>						
Alto	-22,900	-27,200	-32,300	-38,800	-40,800	-46,300
Baja	-22,700	-11,800	-5,700	-5,800	-5,900	-6,100
Centro	800	100	-700	-1,700	-2,000	-2,900
Este	-1,600	-1,800	-1,900	-300	-400	-500
Oeste	-2,400	-2,600	-2,900	-2,400	-2,500	-2,800
<b>Subtotal Mojave</b>	<b>-48,800</b>	<b>-43,300</b>	<b>-43,500</b>	<b>-49,000</b>	<b>-51,600</b>	<b>-58,600</b>
<b>MB/JV Area</b>						
Copper Mtn. Valley	-300	-300	-400	-400	-400	-600
Johnson Valley	2,270	2,260	2,260	2,250	2,250	2,250
Means/Ames Valley	-100	-100	-200	-300	-400	-400
Warren Valley	-600	-700	-1,000	-1,200	-1,300	-1,600
<b>Subtotal MB/JV*</b>	<b>-1,000</b>	<b>-1,100</b>	<b>-1,600</b>	<b>-1,900</b>	<b>-2,100</b>	<b>-2,600</b>
<b>Total</b>	<b>-49,800</b>	<b>-44,400</b>	<b>-45,100</b>	<b>-50,900</b>	<b>-53,700</b>	<b>-61,200</b>
<b>Average Annual SWP Supply:</b>	<b>52,300</b>	<b>53,800</b>	<b>55,300</b>	<b>58,400</b>	<b>58,400</b>	<b>58,400</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>2,500</b>	<b>9,400</b>	<b>10,200</b>	<b>7,500</b>	<b>4,700</b>	<b>-2,800</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

## Exhibit L

Excerpts from PEIR and PEIR Appendix C regarding detailed analysis or management of accumulation of TDS resulting from recharging State Water Project water.



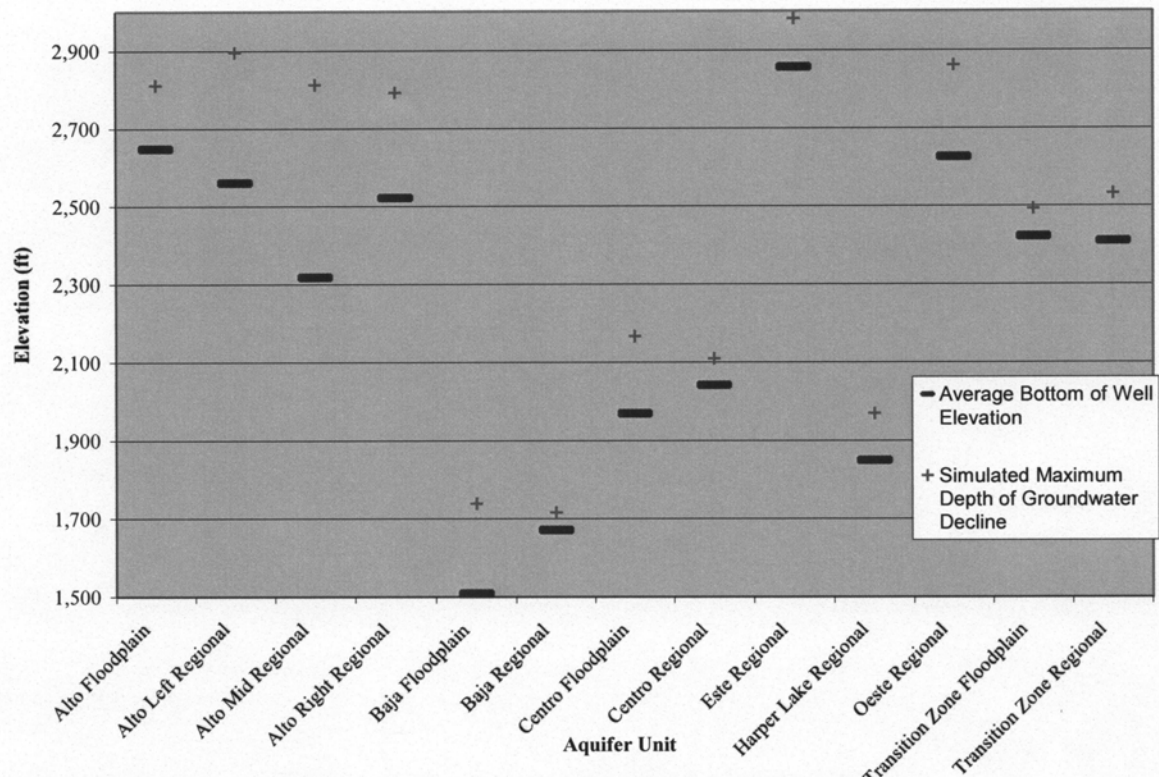


Figure 3.2-11: Average Well Bottom Elevations vs. Minimum Simulated Elevations

### Mitigation Measures

None required.

### Significance After Mitigation

Less than significant.

The 2004 RWMP establishes Management Actions to monitor groundwater levels and quality

**Impact 3.2-3: Recharge water quality could adversely affect groundwater quality. Over the long-term, imported water would contribute to mass loading of salts and other constituents.**

### Water Quality

Supplemental recharge water in the MWA service area consists of either SWP water or reclaimed wastewater. Although some filtration is provided during percolation, recharge water quality can directly affect groundwater quality. Reclaimed wastewater is generally provided a minimum of secondary treatment and is produced by the VVWRA, the City of Barstow, or conveyed to the region from the mountain communities south of the service area via natural channels. Reclaimed wastewater may contain elevated TDS and nitrate concentrations. Water Recycling Requirements



issued by the RWQCB establish water quality thresholds for these constituents. Conditions of these permits generally require monitoring for adverse effects on groundwater.

SWP water is imported through the California Aqueduct and is currently recharged into the ground through periodic releases to the Mojave River and through recharge basins located along the Mojave River Pipeline and the Morongo Pipeline. SWP water quality varies substantially year to year, but is generally consistent with drinking water standards. TDS concentrations average around 300 ppm, but can vary significantly<sup>12</sup>.

SWP water from the California Aqueduct contains high levels of both dissolved organic carbon (DOC) and bromide, and can exceed the drinking water standard for trihalomethane (THM) formation (0.10 mg/l total THMs). THMs are formed when the DOC reacts with chlorine added as a disinfectant during the water-treatment process<sup>13</sup>. Recharging SWP water could increase concentrations of THMs in groundwater.

Table 3.2-4 summarizes existing groundwater quality as reported in wells throughout the MWA service area. Groundwater in the region is generally good. Local municipal water purveyors provide treatment to extracted groundwater as needed to comply with DHS requirements and drinking water standards.

MWA has imported and recharged SWP water into the Alto subarea for over 25 years. MWA has conducted groundwater monitoring near the Mojave River to evaluate the effect of recharging SWP water. The 2004 RWMP would substantially increase SWP water imports, which could alter groundwater quality. Treatment of extracted groundwater conducted by water purveyors may need to be modified to reflect the changed water quality and comply with state drinking water standards.

### Mass Loading

Groundwater in the Floodplain Aquifer generally flows north and east from the Alto subarea to Baja and beyond the MWA service area boundaries to Afton Canyon. Although this flow provides some flushing of water, importing water adds to the overall volume of salts and other constituents in the basin. Over a long period of time, these added constituents can accumulate and eventually pose water quality concerns. MWA analyzed total salt loading into the basin resulting from importing the full SWP entitlement over a 20-year period. **Table 3.2-10** summarizes the results of the analysis for each subarea. The calculations assume an aquifer depth of 1,000 feet, and an average SWP water TDS concentration of 281 ppm. **Appendix C** provides a summary of the analysis. The results indicate that over a 20-year planning period of importing the full SWP entitlement, salt loading from imported water would have a minimal impact on TDS concentrations. Over a longer period of time (100 years) TDS concentrations within the Alto subarea could increase by 20%. However, the concentration in Alto would remain lower than for surrounding subareas.

<sup>12</sup> Department of Water Resources. *Water Quality Assessment of State Water Project, 1998-99*, July 2000.

<sup>13</sup> USGS, *Characterization of Dissolved Organic Carbon (DOC) Related to the Formation of Trihalomethanes (THMs) on Delta Islands*, Report No. CA516, 1999.

**TABLE 3.2-10**  
**ESTIMATED TDS LOADING AND FUTURE CONCENTRATION**

	Este	Oeste	Alto	Centro	Baja
<b>Inflows (lbs/year)</b>					
Surface water inflow	462,000	408,000	20,381,000	19,787,000	15,300,000
Subsurface inflow			2,302,000	1,750,000	3,790,000
Import of wastewater	2,870,000		3,094,000		
SWP Imports	529,000	1,786,000	37,798,000		3,401,000
<b>Total Inflow (lbs/year)</b>	<b>3,860,000</b>	<b>2,194,000</b>	<b>63,576,000</b>	<b>21,536,000</b>	<b>22,516,000</b>
<b>Total Outflow (lbs/year)</b>	<b>1,946,000</b>	<b>356,000</b>	<b>21,536,000</b>	<b>18,762,000</b>	<b>8,217,000</b>
<b>Net Inflow</b>					
% change at year 1	0.05	0.16	0.2	0.01	0.05
% change at year 20	1.02	3.13	4.02	0.13	0.97
<b>TDS Concentrations (ppm)</b>					
year 0	655	396	269	813	546
year 1	655	397	270	813	546
year 20	662	408	280	814	551

Source: SWS, 2004.

Other constituents such as metals, DOC, and THMs could accumulate in a similar fashion. Over the 20-year planning period, the potential impact of mass loading into the basin would not be significant, since the importation of SWP water would not result in exceedances of drinking water regulatory thresholds. However, continued monitoring of groundwater near recharge basins and at production wells will provide data to determine the necessity to modify treatment as loading increases and drinking water standards change.

### Mitigation Measure

**M3.2-1 MWA shall implement groundwater monitoring programs near recharge basins to assess changes in groundwater quality.**

### Significance After Mitigation

Less than significant

**Impact 3.2-4: Recharge basins could adversely affect groundwater quality by transporting surface contamination into aquifers. In addition, where groundwater is shallow, raised groundwater elevations could encounter surface or vadose zone contamination, degrading groundwater quality.**

Groundwater recharge projects would affect groundwater quality depending on the quality of recharge water and local surface contamination. Over the course of the region's development, numerous contamination sites have been created by military, industrial, and commercial land uses. Placing recharge basins near areas of surface contamination could either transport contamination directly to the groundwater, or affect underground contamination plumes and potentially reduce the effectiveness of on-going remediation efforts. Figure 3.2-8 identifies known Superfund sites

## **APPENDIX C**

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### **SUMMARY OF SALT LOADING ANALYSIS**



**Mojave Basin Salt Balance**  
Technical Memorandum  
August 20, 2004

This memorandum describes the methodology used to estimate salt loading in the Mojave River Basin resulting from the import of State Water Project water. The basin is essentially a closed basin where imported salts will accumulate over time. The accounting reported herein include salts will exiting the Mojave Water Agency through Afton Canyon. Salt import via human and animal feed products, and salt export via agricultural commodities are relatively small, and are not included in this accounting. The assumptions, methods, and results are reported below.

### **Aquifer Volume**

The increase in salt concentration is dependent to a large extent on the basin volume available to dilute imported salt. This section describes how this volume was estimated.

1. The calibrated USGS ModFlow simulation study<sup>1</sup> for the Mojave River Basin used two aquifer units. The upper unit was modeled as 100 feet thick throughout the basin. The lower unit was modeled as 700 feet thick, though the report notes that the regional aquifer is more than 2,000 feet thick in some places.

The study reports upper layer specific yield of from 5% in the regional aquifer, to up to 39% in the Mojave River Floodplain in the upper Alto subarea. A areal weighted average of specific yield for each subarea is presented in the adjacent table.

Average Specific Yield	
Alto	11%
Baja	15%
Centro	13%
Este	12%
Oeste	5%

The lower unit was modeled as a confined aquifer, and was assigned a specific storage ( $S_s$ ) of  $1e-6$  per foot.<sup>2</sup> Specific storage is the volume of water that will be released from confined aquifer storage under a unit decline in hydraulic head<sup>3</sup>, but is not directly related to water in storage.

2. An inventory of stored groundwater was commissioned by MWA in 1990.<sup>4</sup> This effort included gravity, magnetics, and electromagnetic induction techniques to map the alluvial materials and bedrock underlying the basin. This study reports water-bearing aquifers to depths exceeding 2,500 feet underlying much of the area. Water volume to a depth of 1000 feet was estimated as 174 million acre-feet.

<sup>1</sup> Stamos, et al., 2001, "Simulation of Ground-Water Flow in the Mojave River Basin, California

<sup>2</sup> This is a very low value – typical of sound rock, per Batu, 1998, "Aquifer Hydraulics", p. 59

<sup>3</sup> Freeze and Cherry, 1997, "Groundwater", p. 58

<sup>4</sup> Subsurface Surveys, Inc., May 1990, "Inventory of Groundwater Stored in the Mojave River Basins"



Total water volume in the basin was estimated as 428 million acre-feet. Total volume of aquifer materials derived from the bedrock contours is about 1,431 million acre-feet – the estimated total porosity is thus about 30%.

**Assumption.** Water volume to a depth of 1000 feet was used in this analysis. Though most wells in the region are a few hundred feet deep, 1000 feet was selected as a reasonable flow zone likely to be tapped by future municipal supply wells designed for high quality supply.

3. Porosity (void space) for unconsolidated aquifer materials range from 25-50% in gravel, sand, and silt, and 40-70% in clays. Effective porosity (interconnected void space) ranges from 10-35% in sands and gravels, and 0-5% in clays.

**Assumption.** For this analysis effective porosity in the upper 1000 feet of aquifer was assumed to be equal to the calibrated specific yield for the upper aquifer unit in the ModFlow model described above. A sensitivity analysis was performed using half this storage value.

### **Native and Import Water Quality**

The existing, or native, water quality concentrations define the baseline from which changes in quality can be evaluated. Native water quality was estimated averaging all measurements in each subarea. Figure 3.2-6 shows locations where TDS measurements are available. These measurements are clustered around areas of municipal production and special investigation zones.

4. Water quality data from the MWA database is summarized in Table Y by sub-aquifer unit for 14 constituents and pH.

**Assumption.** For this analysis, it was assumed that the average of all TDS measurements in a Subarea was representative of the Subarea concentration. Total volume of water and salts is presented in the table below.

Subarea:	Este	Oeste	Alto	Centro	Baja	Entire Mojave Basin
Total Water Volume (AF)	5,300,000	6,500,000	79,500,000	43,500,000	39,300,000	174,100,000
Porosity	30%	30%	30%	30%	30%	30%
Effective Porosity	12%	5%	11%	13%	15%	12%
Active Aquifer Volume (AF)	2,100,000	1,100,000	28,600,000	19,400,000	19,800,000	71,000,000
TDS Concentration (ppm)	655	396	269	813	546	508
TDS Load (tons)	1,900,000	600,000	10,500,000	21,400,000	14,700,000	49,000,000

5. The California Department of Water Resources monitors State Water Project water quality. The water quality information at Checkpoint 41- Tehachapi Bay, just upstream of the turnouts for the Mojave Water Agency, was used in this analysis. The tabulated water quality data used for this analysis is a three year average from

2000-2002. A representative average value of 281 ppm TDS was used for SWP imports in this analysis.

6. Other values of TDS concentration were estimated as follows:

**Assumption.** Mojave River flows entering the area from the San Bernardino Mountains were assigned a TDS value of 100 ppm.

**Assumption.** Wastewater inputs were assigned a TDS value of 406 ppm based on records of average VVWRA discharge concentrations.

**Assumption.** No salts were assumed removed from the basin in agricultural products or other export commodities. No salts were assumed imported in human and animal food imports.

**Assumption.** Surface water outflows from the Centro and Baja subareas were assumed to have a concentration one-third of the sum of surface inflow concentration and groundwater basin concentration.

Each of these assumptions merits further examination and refinement in subsequent studies planned by MWA.

### Salt Balance Estimate

7. The subarea water balance for the recommended RWMP Alternative D6r was used for this analysis. Alternative D6r reflects 2020 development conditions, Agricultural Scenario 2 (significantly decreased use), 10% municipal conservation, and the import of approximately 57,000 acre-feet of SWP water per year. The water balance was calculated using the Stella modeling environment which uses inter-basin flow relationships derived from the USGS ModFlow model. All sub-areas are in long-term hydrologic balance using the Alternative D6r assumptions.

8. Full 2020 imports are assumed for all years in the analysis.

9. This analysis yields the following approximations:

- Existing salt load in upper 1000 feet: 49 million tons
- Natural and non-SWP net salt inflow: 9,500 tons/yr (0.02%/yr)
- Annual SWP salt inflows: 22,000 tons/yr (0.04%/yr)
- Total annual net salt inflow: 31,000 tons/yr (0.06%/yr)
- Imports would approximately triple the natural rate of salt accumulation.
- Over 20 years, average salt concentrations in the Mojave Basin would increase by about 1.3% from 508 to 515 ppm TDS in the upper 1000 feet of aquifer.
- The greatest increase would be in the Alto subbasin with a 20-year increase in salt concentration of about 4 percent from 269 to 280 ppm TDS.

- The lowest estimated increase would occur in the Centro subbasin with a 20-year increase in salt concentration of about 0.1% from 813 to 814 ppm TDS.

	Este	Oeste	Alto	Centro	Baja	Entire Mojave Basin
<b>INFLOWS (tons/yr TDS)</b>						
Surface Water Inflow	230	200	10,190	9,890	7,660	
Subsurface Inflow			1,150	870	1,890	
Deep Percolation of Precipitation	0	0	0	0	0	
Import Wastewater	1,430		1,550			
SWP Imports	260	890	18,900	0	1,700	21,750
Total Inflows (tons/yr)	1,920	1,090	31,790	10,760	11,250	
<b>OUTFLOWS (tons/yr TDS)</b>						
Surface Water Outflow			9,890	7,490	3,990	
Subsurface Outflow	970	180	870	1,890	120	
Phreatophyte Consumption			0	0	0	
Consumptive Use of Pumping	0	0	0	0	0	
Total Outflows (tons/yr TDS)	970	180	10,760	9,380	4,110	
Net Inflow (tons/yr)	950	910	21,030	1,380	7,140	31,410
%/yr	0.05%	0.15%	0.20%	0.01%	0.05%	
%/20 yr	1.00%	3.03%	4.01%	0.13%	0.97%	
TDS, year 0	655	396	269	813	546	
TDS, year 1	655	397	270	813	546	
TDS, year 20	662	408	280	814	551	

10. If the effective aquifer volume is half the value estimated above, salts would accumulate at approximately twice the rate displayed in the table above.

## Exhibit M

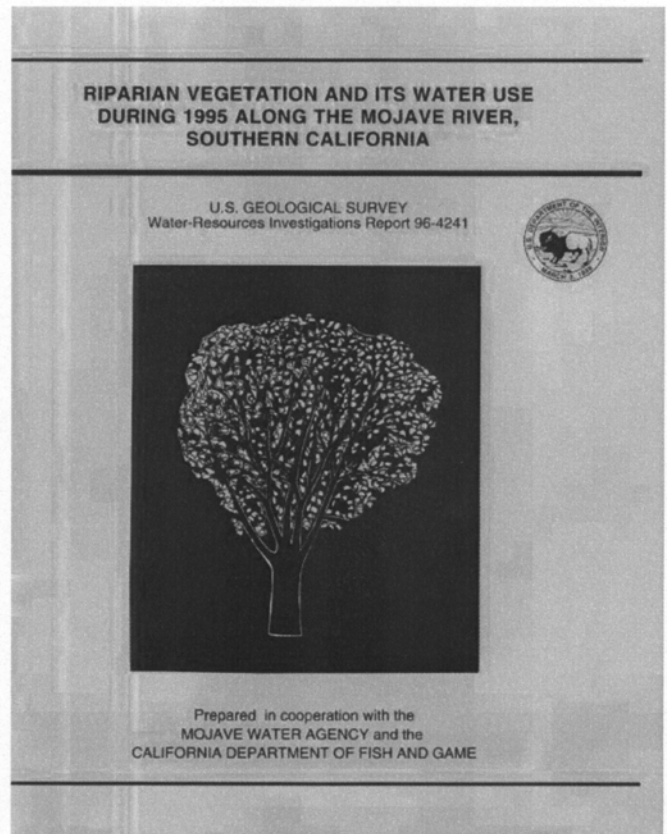
Excerpts from the USGS report Riparian Vegetation and Its Water Use During 1995 Along the Mojave River and Mojave Weed Management Area documents Mojave River Salt Cedar Control Plan and Long Range Plan regarding invasive species water consumption, monitoring plans and methods.



### Eradication of Non-Native Plant Species

Eradication of non-native species has been identified as a way to enhance the health of riparian habitat. Many of the non-native plants consume significant amounts of water, crowd out native species, cause flood potential from sedimentation within the river channel and increase fire potential of sensitive riparian habitats. MWA is currently funding part of a cooperative effort to eradicate non-native species together with the Mojave Desert Resource Conservation District and the Mojave Weed Management Area (MWMA). The MWMA is formed of a number of federal, state and local agencies to address the problem of invasive plants in the Mojave Desert. Over 5,000 acres will be cleared of tamarisk and other non-native species. 400 acres will be cleared under this grant proposal. Initial water savings are estimated at approximately 500 acre-feet per year.

Figures 2 and 3 show the results of satellite imagery mapping that the MWA partially funded to locate tamarisk infestations for the weed management program along the Mojave River.



### **Work Completed or Expected to be Completed Prior to May 1, 2007**

The following activities are complete or are expected to be completed prior to May 1, 2007, the assumed grant contract execution date. The overall project schedule is shown in Attachment 5 of this proposal and shows work completed to date and the activities that are scheduled to occur prior to May 1, 2007.

### **Upper Mojave River Well Field and Water Supply Pipeline Project**

- Completed CEQA:
- 2004 Regional Water Management Plan (MWA's IRWMP) – adopted February 24, 2005. Examines 53 distinct projects and water management actions for balancing water supply and demand by 2020. Selects a Recommended Project with 19 prioritized elements

along the Mojave is uncertain. However, it seems to prefer the wetter and more humid environment of coastal streams, such as the Santa Ana River.

During 1995, there were about 10,000 acres of riparian vegetation and about 2,700 acres of desert willow (areal densities greater than 1 percent) along the main stem of the Mojave River. A total of about 12,000 acres of the riparian zone had been disturbed and was being used for agricultural, residential, and other uses—including about 5,400 acres in the Alto subarea, 6,300 acres in the Centro subarea, and 420 acres in the Baja subarea. In addition, a total of about 13,000 acres of the riparian zone was barren (less than 1 percent areal density of riparian vegetation or desert willow). The barren land typically was in the channel of the Mojave River where floods had removed vegetation or where the water table was too deep to support phreatophytes. During 1995, there were about 2,700 acres of barren land in the riparian zone of the Alto subarea, 7,200 acres in the Centro subarea, 2,400 acres in the Baja subarea, and about 330 acres in the Afton area.

## ESTIMATES OF WATER USE

### Transfer of Previous Estimates

Water use by the riparian vegetation along the Mojave River can be estimated by using the results of a select group of studies conducted elsewhere in the southwestern United States. Estimates of water use from other studies were considered for use if they were obtained using water-budget, streamflow-depletion, or micrometeorological techniques and if they were representative of fairly large areas (several acres) of the flood-plain environment. Tank-lysimeter studies, in which water use is determined in small artificial environments, were not used. Also, physiological studies using stem-flow gauges were not considered for use because converting the flow of sap in a few plant stems to an estimate of water use for a complete forest is not practicable.

Other criteria used for acceptance of water-use estimates were the documentation of areal densities of the plant species studied and a climate similar to that of the Mojave Desert. Many factors define an area's climate, but free-water surface evaporation is an excellent indicator of the climatic variables that also partly control transpiration of plants, such as solar radiation and wind. Thus, results of other studies were considered

transferable if annual free-water surface evaporation was within about 10 percent of that along the main stem of the Mojave River, which ranges from about 60 to 85 in. (National Oceanic and Atmospheric Administration, 1982).

As pointed out earlier, distinct communities of riparian vegetation grow in distinct hydrologic niches along the Mojave River (Meinzer, 1927). Literature review indicates that these same communities commonly grow in the same hydrologic niches throughout the southwestern United States (Bowie and Kam, 1968; Weeks and others, 1987; Ball and others, 1994; U. S. Bureau of Reclamation, 1995, and Lines, 1996). The depth of the water table probably is the most important hydrologic factor that controls the composition and density of riparian plant communities. In the authors' opinion, this makes the transfer of water-use data for the same plant communities and areal densities in the southwestern United States a valid approach if the criteria above are met.

On the basis of micrometeorological data collected along the Pecos River flood plain, in southeast New Mexico, Weeks and others (1987) estimated that annual water use by healthy saltcedar with areal densities ranging from about 50 to 80 percent averaged about 3 ft (or 3 acre-ft per acre). Ball and others (1994) and the U.S. Bureau of Reclamation (1995) in a study along the lower Colorado River near Blythe, California, estimated that saltcedar annually used 2.3 to 2.5 ft of water. These estimates were based on micrometeorological data collected at healthy saltcedar thickets. Examination of aerial photographs of the saltcedar study sites supplied by the U.S. Bureau of Reclamation indicated that areal densities ranged from about 80 to 95 percent. Similarly, it was estimated that healthy mesquite along the lower Colorado River annually used about 1.4 ft of water. Areal densities of the mesquite study sites, estimated from aerial photographs, ranged from about 50 to 80 percent.

Water-use estimates from both areas are considered transferable to the Mojave River basin because annual free-water surface evaporation ranges from about 75 to 85 in. in the Pecos River study area and from about 80 to 90 in. in the study area along the lower Colorado River (National Oceanic and Atmospheric Administration, 1982). In the Centro and Baja subareas and in the Afton area, where saltcedar and mesquite are prevalent, annual free-water surface evaporation ranges from about 75 to 85 in. Using the water-use data from the Pecos River and Colorado River studies, it

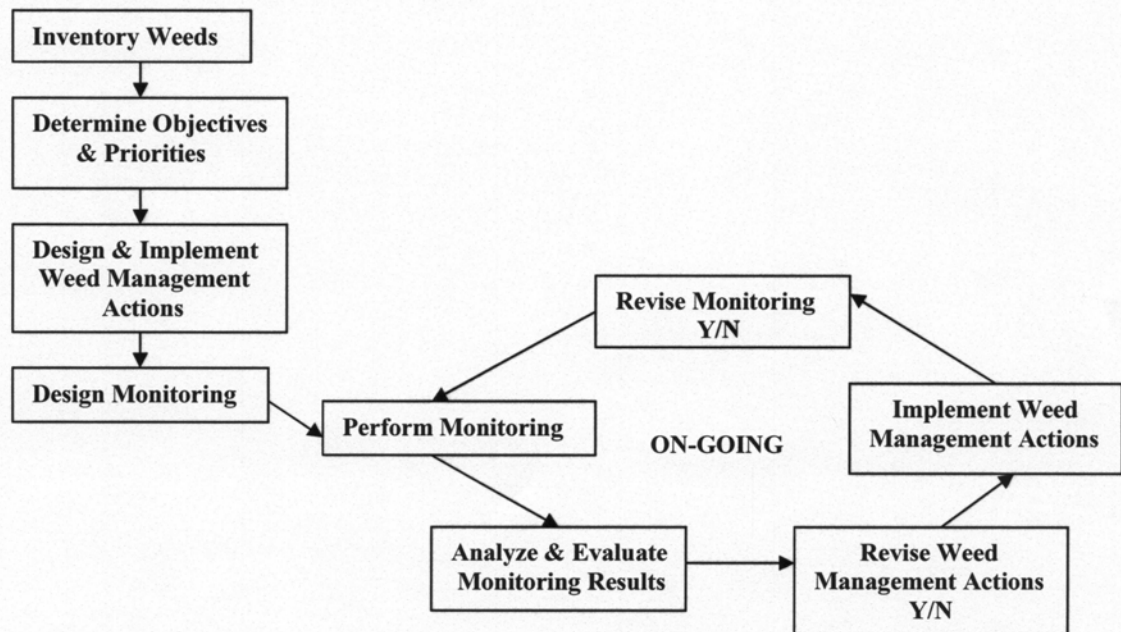
## MOJAVE RIVER SALT CEDAR CONTROL PLAN

**Containment** is an objective aimed at preventing infestation expansion, and focuses on halting spread until suppression or eradication can be implemented.

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### VI. MONITORING

Repeated collection and analysis of information is required to evaluate progress in meeting weed management objectives. If objectives are not being met, weed control actions need to be modified. The following structured approach will be used to collect and analyze resource information.



### VI. WEED MANAGEMENT ACTIONS

IWM employs a combination of management techniques (biological, chemical, mechanical, and cultural) that, together, will control a particular weed species or infestation efficiently and effectively, with minimal adverse impacts to non-target organisms. IWM is species-specific, tailored to exploit the weaknesses of a particular weed species, and designed to be practical and safe.

All saltcedar control projects implemented through this plan will include actions that foster native plant revegetation that replaces saltcedar.



- 3) Containment is a weed management objective aimed at preventing infestation expansion and spread, and may be conducted with or without any attempt to reduce infestation density. This objective is an alternative to eradication or suppression. Containment focuses on halting spread until suppression or eradication can be implemented.

In order to ensure the success of a weed control project, specific project goals must be made. These project goals should be made for both the short and long-term, as persistent weeds take several years to achieve the desired level of control. For example, project goals may be made for 1-year, 5-year, and 10-year increments. Management plans should be revised annually and modifications made as needed. Mapping infestation sites should be performed to develop priority weed control projects, measure baseline vegetation data, biological control agent population information, and project success.

Monitoring and evaluation of projects indicate the degree of success and impacts to target and non-target vegetation resulting from weed management activities. Other than personal observation and professional judgment, there is seldom any baseline information available on which to make evaluations. Since success will depend on achieving the objectives in strategic plans and integrated weed management plans, it is imperative that monitoring data be collected to assess changes and trends. The MWMA will establish inventories or collect baseline data prior to treatment (pool of existing knowledge and data from cooperators); develop specific evaluation methods prior to project onset; collect reduction in cover data to evaluate control success; evaluate the effectiveness of treatment and management measures at six months, one year, and two years post treatment; conduct cover sampling and photograph each project site on three occasions: pre-treatment, six months post-treatment, and one year post-treatment and compile and present data annually to the MWMA.

**Action:** MWMA Control and Monitoring actions include:

Saltcedar Control Project at the Lewis Center (Mojave Narrows)

*(SB1740 and Mojave Water Agency funding; BLM equipment and Apple Valley HS volunteers)*

- Saltcedar will be treated using a cut-stump/herbicide application (Roundup Pro Concentrate).
- The MDRCD will provide a Leader and Assistant; volunteers from Apple Valley High School will assist with control efforts.
- Monitoring will be conducted by the Lewis Center for Educational Research.
- The MWMA will seek funding for additional control/restoration efforts at this site.

Sahara mustard Control Project at Johnson Valley OHV Area (USGS, BLM, & MDRCD)

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- This is a pilot control project using mechanical and chemical methods to eradicate a known population of Sahara mustard.
- Control methods for Sahara mustard are mostly unknown; results from this project will assist in determining effective methods for eradicating new populations.
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- Interactions between invasive grasses, fire, and atmospheric nitrogen deposition are also being evaluated.
- Herbicide and early season fire are being evaluated as control methods for the invasive grasses *Bromus rubens* and *Bromus tectorum*.
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Effects of Off-Highway Vehicles on Soils and Biodiversity in the Mojave Desert  
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- This project is evaluating the cumulative effects of 30 years of OHV use on soils and biodiversity at the Dove Springs Open Area.
- Sampling is stratified by high, medium, and low densities of OHV tracks digitized from aerial photos taken periodically between the 1960s and 2000s.
- One of the response primary variables being monitored is dominance by invasive annual plants.

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- Tamarisk was mapped using GPS at Whiskey Springs and Arrastre Creek.
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Bureau of Land Management – the Barstow Field Office Ten-Year Plan includes active control and maintenance of:

- Saltcedar on approximately 700 acres in the Afton Canyon area of the Mojave River.
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- Small infestations on public land of upland weeds, including sahara mustard, five-hook bassia, camel thorn, African rue, tree-of-heaven, yellow-spined thistle, and malta star thistle.
- Small infestations on public land of giant reed, when discovered.

Funding and Finance

Funding for all phases of weed management is chronically inadequate. The current rate of spread of major weeds, and the introduction of new species, is far out-stripping our ability to contain them. The problem is most acute in counties with sparse populations and small private land bases, resulting in a low tax base. Furthermore, federal funding is still far from sufficient to deal with the extent and scope of the problem on the nearly 8.5 million acres of federal land in the MWMA. Beyond state appropriated funds, a large pool of available grant money exists. Grant funds are not typically targeted specifically for weed projects, but can be tapped in to by encompassing weed control into larger watershed and restoration level projects.

MWMA cooperating members are another source of funding. Many partners have in-kind support in the form of control equipment, educational materials, computer and printing capabilities, and a variety of unique expertises. While large-scale projects require considerable funding, the MWMA can achieve many educational, inventory and mapping, and limited control objectives by drawing on resources within the MWMA group.

**Action:** MWMA Funding and Finance actions include:

- Grants – Beyond SB1740 funds, the MWMA will submit proposals for at least two grants each year. Each grant will target one project designated by the MWMA partners.
- Assessment of In-Kind Resources – To continually recognize resources available within the MWMA, members will be surveyed as to what in-kind contributions could be made to complete new projects.
- MWMA Program Coordinator – The MWMA Program Coordinator is responsible for arranging/recording meetings, maintaining records, preparing/managing grant proposals, maintaining the MWMA website and GIS, and performing other administrative/project tasks. The MDRCD has provided part-time funding for this position; however, the MDRCD does not have the financial resources to support this position indefinitely. The MWMA partners

## Exhibit N

Excerpts from the MWA IRWMP, Mojave Weed Management Area documents Mojave River Salt Cedar Control Plan and Long Range Plan and Step 2 application PAEP for Regional Water Conservation Program regarding ongoing project monitoring and data gaps.

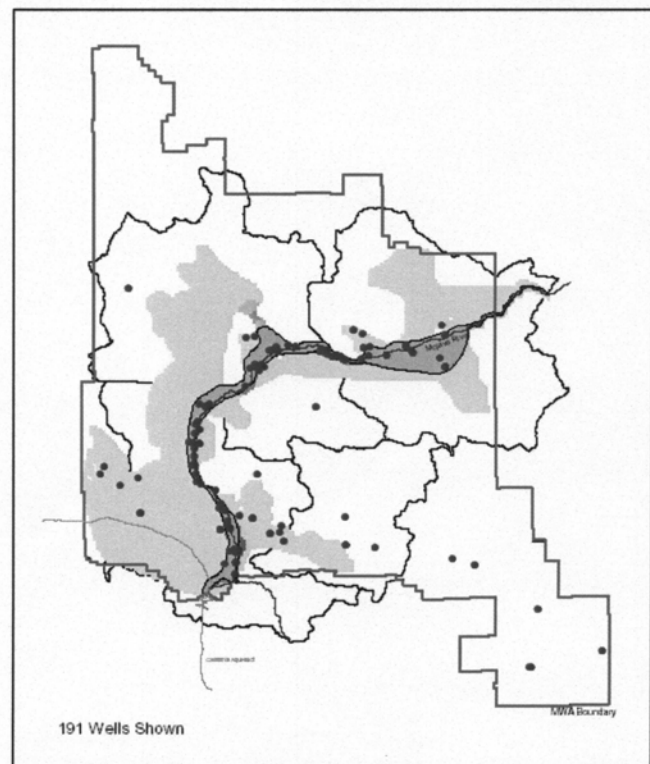


## Groundwater Levels

MWA has several programs for groundwater level monitoring, and has been increasing in-house staff efforts for collection, compilation, and archiving an increasing quantity of collected data. This work is supplemented by efforts of the U.S. Geological Survey (USGS) as part of a cooperative water services program with MWA. There are 121 monitoring wells within the Mojave Basin Area from which water level and water quality samples are taken.

These include 53 wells from which the samples are taken annually and 46 wells from which samples are taken semi-annually. Monitoring wells are concentrated primarily near existing areas of production. Figure 10 - 1 shows the location of 191 wells with known well construction data including depth and perforation intervals collected from USGS and other sources.

The Riverside County Superior Court Judgment After Trial of January 10, 1996<sup>44</sup> (the Judgment) ordered certain parties in the litigation to undertake certain actions. The Judgment requires the Watermaster to establish a Biological Resources Trust Fund for the benefit of the riparian habitat areas and species identified in the Judgment. The Judgment also refers to a Habitat Water Supply Management Plan (Conservation Plan) to be prepared by the CDFG for the benefit of these riparian habitat areas and species identified in the Judgment. These riparian habitat areas and species are listed in Exhibit H of the Judgment. The Conservation Plan was released in June 2004.



Groundwater levels were established in Exhibit H of the Judgment for key wells in the Mojave River floodplain. These wells, and their associated groundwater level target as measured from the ground surface to standing water are:

<sup>44</sup> City of Barstow et al v. City of Adelanto, Riverside County Superior Court. Case No. 208568



- wells H1-1 and H1-2 in the Victorville/Alto Zone (upper Narrows area) are to be maintained at 7 feet
- well H2-1 in the Lower Narrows/Transition zone is to be maintained at 10 feet
- well H3-1 in the Harvard/Eastern Baja Riparian Forest Habitat (Camp Cady area) is to be maintained at 7 feet. Well H3-2, also in the Camp Cady area, is to be maintained at 1 foot above ground surface to ensure adequate surface water habitat

Of these wells, only H3-1 has been installed; other monitoring is accomplished using surrogate wells or gaging stations.<sup>45</sup> If these water levels are not maintained, funds from the Biological Trust Fund will be expended on mitigation activities. MWA is continuing to coordinate with DFG, to further final well siting and installations.

MWA is working to increase use of water level measurements to better quantify the movement and storage of groundwater, and to effectively increase understanding of the ground water basins. This effort will include improvements to existing data collection programs through improved use of technology, including automated data collection processes and use of spatial database software. These processes should provide consistent data collection, a more geographically representative range of data, and measurements that are more discrete at depth and over time. Current efforts are focused on development of the Agency's Key Well program and a computerized geographic information database system. SCADA telemetry technologies are also being developed to obtain real-time data and control of the Agency's pipeline facilities and to minimize travel time of field staff.

**Action:** MWA will ensure that sufficient monitoring wells are installed around each recharge site to provide information needed to determine vertical and horizontal groundwater flow conditions and potential groundwater mounding in the vicinity of each site. In general, this means that monitoring points will be established around each recharge site, depending upon local conditions. Sites with complex geology may require multiple completion wells to monitor water levels in all affected strata. Movement of recharged water will be tracked to monitor recharge effectiveness.

**Action:** Existing monitoring wells will be maintained and gaps in data identified. The need for additional monitoring wells will be assessed and a plan developed for construction of additional wells if necessary. This assessment could lead to the identification and elimination of some superfluous measurement points.

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<sup>45</sup> N. Caouette, personal communication, November 26, 2003

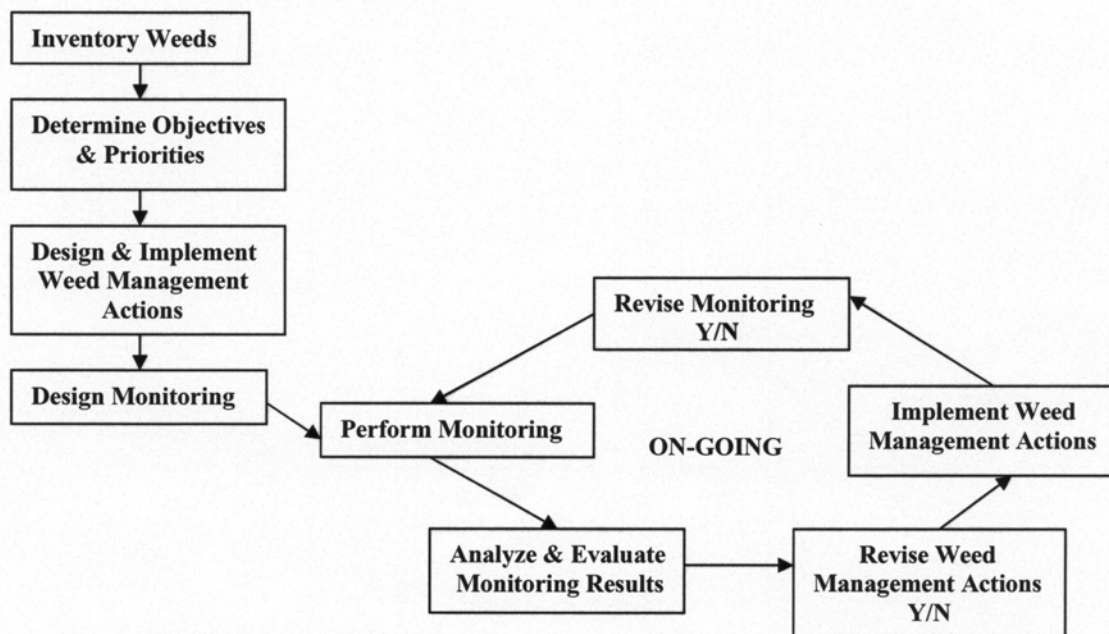
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# Regional Water Conservation Program PAEP

N/A

## vii. Determine economic benefits of implementing project

- Increased Water Supply
- Household and Commercial Efficiency Analysis for Water Use

### D. Project Activities or Tasks:

(Please refer to Section 5 for more detailed work plans associated with this grant application, and Section 8 for AWAC planning documents)

Task 1: Direct Project Administration: *Coordination with the AWAC group to implement conservation plans and ensure that all members of AWAC are implementing the same conservation efforts.*

Task 2: Monitoring and Reporting: *A monitoring plan to establish baseline data will be developed and made available to the 29 AWAC members. It will evaluate what data is being collected currently as it relates to water usage, and what other types of data need to be collected to be able to successfully compare water use patterns before and 3 years following conservation programs.*

Task 3: Construction and Implementation: *This will involve water audits and retrofits.*

Task 4: Conservation Media Campaign: *This will involve radio and newspaper ads, and distribution of conservation literature targeted for arid environments and outreach programs.*

### E. Category of Project Activities or Tasks:

*All project activities and tasks fall into the Habitat Restoration Category.*

## II. Project Goals & Desired Outcomes

***The goals of this project are:***

### **Goal 1**

*Educate the local communities with the understanding of the importance of water conservation.*

### **Goal 2**

*Provide the local communities with the tools to effectively reduce per capita consumption to targeted goals.*

### **Goal 3**

*Reduce regional water use by 10% gross per capita by 2010, 15% by 2015, and 20% by 2020 (5% in Morongo Basin) to achieve a sustainable, reliable supply to meet regional water demands.*

## Exhibit O

Excerpts from the submitted updated UWMP (2005) documenting how water supply reliability will be improved through implementation of the IRWMP.



# MOJAVE WATER AGENCY



## 2004 REGIONAL WATER MANAGEMENT PLAN

INTEGRATED REGIONAL WATER MANAGEMENT PLAN  
GROUNDWATER MANAGEMENT PLAN  
URBAN WATER MANAGEMENT PLAN



SUPPLEMENT A:  
2005 URBAN WATER  
MANAGEMENT PLAN  
UPDATE

December 8, 2005





## Section 2 – Step 4: Reliability of Supply

This section describes the reliability of the water supply and the vulnerability to seasonal or climatic changes.

**Annual Variability of Water Supply** – The RWMP used the 1931-2001 hydrologic period to represent long-term hydrologic conditions in the basin. The variability of the supply is shown on Table 4-9(s), and is described in more detail in Chapter 4 of the RWMP.

**Inconsistent Water Sources** – Because water use within the MWA service area is supplied entirely by groundwater, MWA does not have any inconsistent water sources that cause reduced deliveries to users within the service area. A potential exception is areas where water quality could limit use as a potable supply. Wellhead treatment or provision of an alternative supply is planned for these areas. While many of the sources that recharge the groundwater basin have high annual variability, including flows on the Mojave River and supplies from the State Water Project, the groundwater basins used within the MWA service area are sufficiently large to allow for continued water use during dry periods with only a temporary decline in groundwater levels. The variability of the water supply is discussed above under Water Sources<sup>12</sup> for both natural and SWP imported supplies.

**Imported Water Supplies** – Current imported supplies are available to MWA through 75,800 acre-feet per year of water contracted through the State Water Project (SWP). This includes the addition of 25,000 acre-feet of Table “A” that was purchased from Berrenda Mesa Water District in 1998. According to the State Water Project Reliability Report (DWR 2002) MWA can expect to receive an average of 58,400 acre-feet of its SWP supply under 2020 conditions. This estimate is based on 2020 demand projections with the current facilities in place.

**Vulnerability to Climatic or Seasonal Shortages – Water Supply Balance for 5-year Increments for Normal, Dry, and Multiple Dry Years** – The groundwater basins are of primary importance for water storage and regulation within the MWA service area, and all water supplies whether local or imported are recharged into the groundwater for future use. This provides water users in the basin with a buffering capacity to absorb the effects of dry years without an immediate impact on water supply availability.

As presented in Table 4-9(s) above<sup>12</sup>, estimates of system-wide SWP reliability range from 69 percent under 2005 demands to 77 percent under 2025 conditions. The RWMP used a previous DWR estimate of 77 percent delivery for all years from 2000 through 2020. As displayed in Table 5-15(s), under long-term average delivery conditions the SWP supply should meet the MWA water needs to at least 2025.

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<sup>12</sup> Section 2 – Step 3

**Table 5-15(s): Average Annual Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)**

	2005	2010	2015	2020	2025	2030
<b>Mojave Basin Area</b>						
Alto	-22,900	-27,200	-32,300	-38,800	-40,800	-46,300
Baja	-22,700	-11,800	-5,700	-5,800	-5,900	-6,100
Centro	800	100	-700	-1,700	-2,000	-2,900
Este	-1,600	-1,800	-1,900	-300	-400	-500
Oeste	-2,400	-2,600	-2,900	-2,400	-2,500	-2,800
<b>Subtotal Mojave</b>	<b>-48,800</b>	<b>-43,300</b>	<b>-43,500</b>	<b>-49,000</b>	<b>-51,600</b>	<b>-58,600</b>
<b>MB/JV Area</b>						
Copper Mtn. Valley	-300	-300	-400	-400	-400	-600
Johnson Valley	2,270	2,260	2,260	2,250	2,250	2,250
Means/Ames Valley	-100	-100	-200	-300	-400	-400
Warren Valley	-600	-700	-1,000	-1,200	-1,300	-1,600
<b>Subtotal MB/JV*</b>	<b>-1,000</b>	<b>-1,100</b>	<b>-1,600</b>	<b>-1,900</b>	<b>-2,100</b>	<b>-2,600</b>
<b>Total</b>	<b>-49,800</b>	<b>-44,400</b>	<b>-45,100</b>	<b>-50,900</b>	<b>-53,700</b>	<b>-61,200</b>
<b>Average Annual SWP Supply:</b>	<b>52,300</b>	<b>53,800</b>	<b>55,300</b>	<b>58,400</b>	<b>58,400</b>	<b>58,400</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>2,500</b>	<b>9,400</b>	<b>10,200</b>	<b>7,500</b>	<b>4,700</b>	<b>-2,800</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

The 2005 Reliability Report substantially reduces estimates of water available under dry year conditions. For an extremely dry year such as 1977, DWR expects only four percent of Table A amounts would be delivered. As shown in Table 5-16(s), this would result in a one-year overdraft of 114,000 acre-feet under 2030 demands, which would be met through demand management measures and increased reliance on stored groundwater.

**Table 5-16(s): Single Dry Year (1977) Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)**

	2005	2010	2015	2020	2025	2030
<b>Mojave Basin Area</b>						
Alto	-47,700	-53,500	-60,500	-69,500	-73,400	-81,700
Baja	-29,700	-18,900	-12,900	-13,100	-13,300	-13,600
Centro	-6,700	-7,700	-8,800	-10,200	-10,800	-12,200
Este	-2,650	-2,850	-3,050	-1,550	-1,650	-1,850
Oeste	-3,350	-3,650	-4,050	-3,650	-3,950	-4,350
<b>Subtotal Mojave</b>	<b>-90,100</b>	<b>-86,600</b>	<b>-89,300</b>	<b>-98,000</b>	<b>-103,100</b>	<b>-113,700</b>
<b>MB/JV Area</b>						
Copper Mtn. Valley	-670	-670	-770	-770	-870	-1,070
Johnson Valley	850	840	840	830	830	830
Means/Ames Valley	-470	-470	-570	-670	-770	-870
Warren Valley	-1,160	-1,260	-1,560	-1,760	-1,860	-2,160
<b>Subtotal MB/JV*</b>	<b>-2,300</b>	<b>-2,400</b>	<b>-2,900</b>	<b>-3,200</b>	<b>-3,500</b>	<b>-4,100</b>
<b>Total</b>	<b>-92,400</b>	<b>-89,000</b>	<b>-92,200</b>	<b>-101,200</b>	<b>-106,600</b>	<b>-117,800</b>
<b>Average Annual SWP Supply:</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>	<b>3,800</b>	<b>3,800</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>-89,400</b>	<b>-86,000</b>	<b>-89,200</b>	<b>-98,200</b>	<b>-102,800</b>	<b>-114,000</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.



The 2005 Reliability Report estimates SWP Table A water available under a six year drought such as 1987-1992 would be about 42 percent. As shown in Table 5-17(s), this would result in an average annual overdraft of 104,900 acre-feet under 2030 conditions, which would be met through demand management measures and increased reliance on stored groundwater.

**Table 5-17(s): Average Annual Single Dry Year (1987-1992) Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)**

	2005	2010	2015	2020	2025	2030
<b>Mojave Basin Area</b>						
Alto	-54,100	-59,900	-66,900	-75,900	-79,800	-88,100
Baja	-29,300	-18,500	-12,500	-12,700	-12,900	-13,200
Centro	-17,900	-18,900	-20,000	-21,400	-22,000	-23,400
Este	-3,200	-3,400	-3,600	-2,100	-2,200	-2,400
Oeste	-3,800	-4,100	-4,500	-4,100	-4,400	-4,800
<b>Subtotal Mojave</b>	<b>-108,300</b>	<b>-104,800</b>	<b>-107,500</b>	<b>-116,200</b>	<b>-121,300</b>	<b>-131,900</b>
<b>MB/JV Area</b>						
Copper Mtn. Valley	-870	-870	-970	-970	-1,070	-1,270
Johnson Valley	100	90	90	80	80	80
Means/Ames Valley	-670	-670	-770	-870	-970	-1,070
Warren Valley	-1,450	-1,550	-1,850	-2,050	-2,150	-2,450
<b>Subtotal MB/JV*</b>	<b>-2,990</b>	<b>-3,090</b>	<b>-3,590</b>	<b>-3,890</b>	<b>-4,190</b>	<b>-4,790</b>
<b>Total</b>	<b>-111,300</b>	<b>-107,900</b>	<b>-111,100</b>	<b>-120,100</b>	<b>-125,500</b>	<b>-136,700</b>
<b>Average Annual</b>	<b>32,600</b>	<b>31,800</b>	<b>31,800</b>	<b>31,800</b>	<b>31,800</b>	<b>31,800</b>
<b>SWP Supply:</b>						
<b>Surplus/Deficit with SWP Supply:</b>	<b>-78,700</b>	<b>-76,100</b>	<b>-79,300</b>	<b>-88,300</b>	<b>-93,700</b>	<b>-104,900</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.



## Exhibit P

Excerpts from the submitted updated UWMP (2005) documenting how water supplies will be available to support future population growth and to stabilize the current groundwater overdraft.

**Table 5-15(s): Average Annual Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)**

	2005	2010	2015	2020	2025	2030
<b>Mojave Basin Area</b>						
Alto	-22,900	-27,200	-32,300	-38,800	-40,800	-46,300
Baja	-22,700	-11,800	-5,700	-5,800	-5,900	-6,100
Centro	800	100	-700	-1,700	-2,000	-2,900
Este	-1,600	-1,800	-1,900	-300	-400	-500
Oeste	-2,400	-2,600	-2,900	-2,400	-2,500	-2,800
<b>Subtotal Mojave</b>	<b>-48,800</b>	<b>-43,300</b>	<b>-43,500</b>	<b>-49,000</b>	<b>-51,600</b>	<b>-58,600</b>
<b>MB/JV Area</b>						
Copper Mtn. Valley	-300	-300	-400	-400	-400	-600
Johnson Valley	2,270	2,260	2,260	2,250	2,250	2,250
Means/Ames Valley	-100	-100	-200	-300	-400	-400
Warren Valley	-600	-700	-1,000	-1,200	-1,300	-1,600
<b>Subtotal MB/JV*</b>	<b>-1,000</b>	<b>-1,100</b>	<b>-1,600</b>	<b>-1,900</b>	<b>-2,100</b>	<b>-2,600</b>
<b>Total</b>	<b>-49,800</b>	<b>-44,400</b>	<b>-45,100</b>	<b>-50,900</b>	<b>-53,700</b>	<b>-61,200</b>
<b>Average Annual SWP Supply:</b>	<b>52,300</b>	<b>53,800</b>	<b>55,300</b>	<b>58,400</b>	<b>58,400</b>	<b>58,400</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>2,500</b>	<b>9,400</b>	<b>10,200</b>	<b>7,500</b>	<b>4,700</b>	<b>-2,800</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

## Exhibit Q

Excerpts from Attachment 16 – CALFED ROD  
Consistency.

# FORM 1

## CALFED ROD CONSISTENCY

**Mojave Water Agency Integrated Regional Water Management Plan** is located in (check appropriate box (es) :

☐

Sacramento–San Joaquin Bay-Delta Region or

☒

The CALFED Solution Area.

The **Mojave Water Agency Integrated Regional Water Management Plan** will assist in meeting the following CALFED Bay-Delta Program Goals (Objectives) (select one or more goals, as appropriate):

☒

Provide good water quality for all beneficial uses;

☐

Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay–Delta to support sustainable populations of diverse and valuable plant and animal species;

☒

Reduce the mismatch between Bay–Delta water supplies and current and projected beneficial uses dependent on the Bay–Delta system; or

☒

Reduce the risk to land use and associated economic activities, water supply, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

Include with Form 1 the following items:

- ◆ A description of how the Proposal assists in meeting one or more of the goals of the CALFED Bay-Delta Program;
- ◆ A description of how the project will be consistent with the CALFED ROD.
- ◆ A description of how the project will, to the maximum extent possible, be implemented through local and regional program.



## Attachment 16 – CalFed ROD Consistency

### Description of how the Proposal assists in meeting one or more of the goals of the CALFED Bay-Delta Program

The objectives of the CalFed Program are to: (1) **provide good water quality** for all beneficial uses; (2) improve and increase aquatic and terrestrial habitats and **improve ecological functions** in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species; (3) **reduce the imbalance between Bay-Delta water supplies and current and projected beneficial uses** dependent on the Bay-Delta system; and (4) reduce the risks that would result from catastrophic breaching of Delta levees.

By providing groundwater storage as a mechanism with the potential to change the timing of exports from the Bay-Delta system, the Mojave RWMP will address the first three of these CalFed objectives. Implementing the RWMP will:

- reduce the reliance on SWP supplies exported from the Delta during dry-year curtailments
- provide storage reserves that will provide alternative supplies during SWP system outages
- provide the potential for changing the timing of Delta exports to enhance water quality and ecologic management

Implementing the RWMP will enhance implementation of the Mojave Basin Area Judgment, provide storage for use in periods of drought or supply outages, reduce the conflict among beneficial water users, improve the ability to transport water through the Bay-Delta system, and reduce the uncertainty of Bay-Delta system water supplies to help meet short- and long-term needs.

The CalFed Water Management sub-program includes the following Actions that could be achieved by changing the timing of Delta exports:

- Reduce the salinity-related impairment of beneficial uses
- Reduce the impairment of agricultural beneficial use through improved outflow patterns and water circulation

The CalFed Water Use Efficiency Program has the following Actions that will be enhanced by the RWMP conservation element:

- Rely on a stakeholder forum to provide a uniform, verifiable, locally-directed process for urban BMP implementation and reporting
- Identify and implement opportunities for improved water use efficiency with a focus on water conservation
- Help urban suppliers prepare, adopt, and implement useful water management plans and comply with the requirements of the Urban Water Management Planning Act
- Ensure that lack of financing ability does not impede implementation of cost-effective measures. Provide easily accessible funding for planning and implementing water management programs.
- Provide adequate assurance that agricultural water supplies will be used at highly efficient levels – the Mojave Area Judgment establishes allocations to agricultural users and provides an efficient mechanism for transfer of allocations to other users

The CalFed Water Transfer Framework is enhanced by:

- The Mojave Basin Area Judgment mechanism for easily transferring water among basin water users

- The Judgment requirement that users producing more than their allocation must either purchase allocation from others or pay for import of water equal to their production (which is generally greater than their consumptive use)
- These transfers are voluntary, increase supply, respect water rights, do not harm ecologic resources, and reduce groundwater overdraft over the long term

The CalFed Riparian Habitat objectives will be enhanced by the RWMP Non-Native Plant Eradication project element in our proposal by:

- Restoration of riparian habitat on public lands using commonly accepted, scientifically valid restoration techniques
- Enhancing the productivity and biodiversity of riparian communities using appropriate management techniques
- Management of groundwater levels by recharge with State Water Project water will support the viability of riparian habitat along the Mojave River floodplain.

#### **Description of how the project will be consistent with the CALFED ROD**

The Mojave Water Agency is located in the area served by the State Water Project in the CALFED Solution Area. The Mojave Water Agency Integrated Regional Water Management Implementation Project will assist in meeting CALFED Bay-Delta Program Goals by:

- **Providing the best quality water** available for all beneficial uses at a very high quality which meets or exceeds all drinking water standards. Groundwater recharge facilities will be located away from areas with naturally high levels of arsenic, nitrate, and chromium VI, and will supply new production facilities in high quality areas that will allow reduction in production in lower quality areas, including areas serving disadvantaged communities. A comprehensive regional conservation program will aid in making efficient use of this high quality resource.
- **An integrated toolbox of water management measures** will allow flexible use of supplies imported from the Bay-Delta system, allowing a reduction in the mismatch between Bay-Delta water supplies and dependent beneficial uses.
- Recharging the large aquifer storage system will **provide a large drought buffer** that will allow MWA water suppliers to endure long outages or direct supplies to other areas or ecosystems in more critical need should a catastrophic breaching of Delta levees occur.

#### **Description of how the project will, to the maximum extent possible, be implemented through local and regional programs**

The Mojave Water Agency began developing the Regional Water Management Plan (its IRWMP) in 2001 as a cooperative effort between water suppliers, regulators, and other stakeholders. **Oversight of implementation of the Plan will be performed by the same local Technical Advisory Committee** that formulated the Plan.

As a result, the Mojave Water Agency 2004 Regional Water Management Plan was adopted on February 24, 2005 by Resolution 798-05. The Programmatic EIR for the Plan was adopted on February 24, 2005 by Resolution 797-05. The Mojave Water Agency was formed in 1960 to provide regional water management to correct declining groundwater levels in the Mojave Basin Area, El Mirage Basin, and Lucerne Basin. MWA was expanded to include the Johnson Valley and Morongo Basin areas, and today covers an area of over 4,900 square miles. As noted in Chapter 2 of the RWMP, water users form the core of the stakeholder group in the basin, which includes water districts, cities, private water agencies, and agribusiness. Additional essential stakeholder involvement includes environmental organizations, regulatory agencies, development interests, and community associations. The